Improving Value Recovery of OSB from Post-Mountain Pine Beetle Wood

Martin W. Feng and Robert M. Knudson

Mountain Pine Beetle Initiative
Working Paper 2005–13

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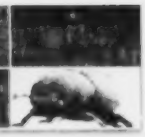

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Abstract

This project examined methods of log hydration and strander operation for OSB manufacture using mountain pine beetle (MPB)-killed wood. The results are potentially beneficial to all kinds of wood product manufacture involving log conditioning (lumber, plywood, OSB, etc.).

The grey stage MPB logs used in this study had little bark and were heavily checked and had relatively even moisture gradients (15%-25%). Their average dry density (0.447) was about the same as that of green pine, but about 23% higher than the dry density of aspen.

Water sprinkling was an effective method for reducing the production of fines and increasing the proportion of larger strands from MPB logs. The generation of fines during stranding was reduced by 28% after 10 days sprinkling, by 30% after 20 days sprinkling and by 35% after 30 days sprinkling. To restore physical properties of dry MPB wood, the optimal hydration appeared to be close to the fibre saturation point.

Similar to vat conditioning, water sprinkling is effective in increasing moisture content in only the outer sections of the logs. There is high potential for improvement of log conditioning to increase moisture uptake in the inner portions of MPB wood. Further development of industrially viable log hydration methods (industrial scale-up of sprinkled log storage, changes to log pond operation, etc.) is strongly recommended.

Strander knife package set-up can have a significant impact on strand size distribution. However, the differences between the outcomes of 50°, 60° and 70° counter knife angles were unexpectedly small in this study.

Résumé

Ce projet a consisté à examiner les méthodes d'hydratation des grumes et le fonctionnement des déchiqueteuses dans le contexte de la fabrication des panneaux OSB avec du bois provenant d'arbres tués par le Dendroctone du pin ponderosa (DPP). Les résultats peuvent être utiles à toutes les installations de fabrication d'objets en bois mettant en jeu le conditionnement du bois (bois brut, contreplaqué, panneaux OSB, etc.).

Les grumes utilisées dans cette étude, tuées par le DPP et au stade gris, n'avaient que peu d'écorce, ont été soigneusement contrôlées et présentaient des gradients d'humidité relativement uniforme (15 %-25 %). Leur densité moyenne à sec (0,447) était pratiquement la même que celle des pins verts, mais environ 23 % plus élevée que la densité à sec des trembles.

L'aspersion d'eau s'est révélée une méthode efficace pour réduire la production de fines et accroître la production de copeaux plus gros à partir des grumes provenant d'arbres tués par le DPP. La production de fines lors du déchiquetage était réduite de 28 % après 10 jours d'aspersion, de 30 % après 20 jours d'aspersion et de 35 % après 30 jours d'aspersion.

L'hydratation optimale permettant de restaurer les propriétés physiques du bois sec provenant d'arbres tués par le DPP s'est révélée proche du point de saturation des fibres.

Semblable au conditionnement en cuve, l'aspersion ne permet d'accroître le taux humidité que dans les couches superficielles des grumes. Il existe donc une réelle opportunité d'amélioration du conditionnement des grumes qui viserait à augmenter le taux d'humidité en profondeur dans le bois provenant des arbres tués par le DPP. Les auteurs recommandent fortement la mise au point de méthodes d'hydratation des grumes fiables pour l'industrie (mise à l'échelle industrielle des entrepôts de grumes avec aspersion, passage aux bassins de flottage, etc.).

La disposition des couteaux de la déchiqueteuse peut avoir une incidence importante sur la distribution de la taille des copeaux. Contre toute attente, les copeaux obtenus avec des angles de contre-couteaux de 50°, 60° et 70° dans le cadre de cette étude se sont cependant révélés très peu différents.

Table of Contents

1 Introduction 1

2 Material and Methods 2
- 2.1 Material 2
- 2.2 Test Methods 2
- 2.3 Material Preparations and Measurement 3
  - 2.3.1 Log Sample Preparations 3
  - 2.3.2 Debarking 5
  - 2.3.3 Water Conditioning 5
  - 2.3.4 Stranding 6
  - 2.3.5 Screening 8
  - 2.3.6 Optical Analysis of Strand Geometry 9
  - 2.3.7 Moisture and density distributions 9

3 Results and Discussion 10
- 3.1 Properties of Grey Stage MPB Wood 10
- 3.2 Strander Set-up Tests 12
- 3.3 Log Storage Tests 20
- 3.4 Vacuum-Pressure Treatment 28

4 Conclusions 30

5 Recommendations 31

6 Acknowledgements 31

7 Literature Cited 31

Appendix I Data from Strander Set-up Tests 33

Appendix II Data from Log Conditioning and Vacuum-Pressure Tests 52

List of Tables

Table 1 Sample identifications for the strander set-up tests 4
Table 2 Sample Identifications for the log storage tests and vacuum-pressure tests 5
Table 3 Properties of Grey Stage MPB Wood, Green Pine and Green Aspen 11
Table 4 Moisture contents and moisture gradients before and after vat conditioning 13
Table 5 Moisture content and moisture gradient of MPB logs before and after water sprinkling and vat conditioning 21
Table 6 Percentages of different strand size categories from each wood log group 27

List of Figures

Figure 1 End-sealed 2-foot long samples 3
Figure 2 Water sprinkling on 2-foot MPB log samples 6
Figure 3 Strander cross-section 7
Figure 4 Knives and counter-knife set-up inside the strander 7
Figure 5 Carmanah laboratory drum strander 8
Figure 6 Samples for moisture and density gradient determination 10
Figure 7 Grey stage MPB logs (standing dead for 20 years) 11
Figure 8 Moisture contents of 20 MPB wood logs before water vat conditioning 13
Figure 9 Screen fractions of different sizes from an MPB wood strand sample 14
Figure 10 Strand size distribution derived from 50° counter-knife angle 15
Figure 11 Strand size distribution derived from 60° counter-knife angle 15
Figure 12 Strand size distribution derived from 70° counter-knife angle 16
Figure 13 Strand size distribution derived from modified 70° counter-knife angle 16
Figure 14 Strand size distributions derived from different counter-knife angles 17
Figure 15 Per cent of fines and pan vs. counter-knife angle 17
Figure 16 Screen fractions of 1.5" through 0.75" vs. counter-knife angle 18
Figure 17 Average strand width *vs.* screen size between 50° and 60° counter-knife angles 19
Figure 18 Average strand length *ys.* screen size between 50° and 60° counter-knife angles 19
Figure 19 Average strand area *vs.* screen size between 50° and 60° counter-knife angles. 20
Figure 20 MPB wood log moisture content *vs.* water sprinkling time 21

Figure 21 Moisture Gradient across MPB Log Section vs. Sprinkling Time 22
Figure 22 Checking in MPB logs prior to sprinkling 22
Figure 23 Checks in MPB logs have closed up after 10 days sprinkling 23
Figure 24 Strand Size distribution without water sprinkling 23
Figure 25 Strand size distribution of MPB wood after 10 days of water sprinkling 24
Figure 26 Strand size distribution of MPB wood after 20 days of water sprinkling 24
Figure 27 Strand size distribution of MPB wood after 30 days of water sprinkling 25
Figure 28 Strand size distribution of green pine 25
Figure 29 Strand size distribution of green aspen 26
Figure 30 Percentage of larger strands (1.5" to 0.75") from each wood log group 27
Figure 31 Percentage of small flakes and particles from each wood log group 28
Figure 32 Strand Size Distribution of Vacuum-Pressure Treated MPB Logs 29

1 Introduction

Mountain pine beetle-killed lodgepole pine trees (*Pinus contorta* Dougl.) which are left standing become grey and dry approximately two years after death. The amount of grey stage beetle-killed wood currently being processed is relatively small as harvesting tries to keep up with recently attacked trees in the green or red stage. However, at some point decisions will have to be made about processing the large quantities of grey stage material and if this can be done economically. A full understanding of the processing of mountain pine beetle (MPB) wood will support decisions to capture value from the MPB wood resource, especially from material that is left standing to be harvested years after attack. The results from research will allow more efficient and economical manufacturing of products from the resource.

One possible end-use for dry lodgepole pine is to manufacture it into oriented strandboard (OSB). British Columbia (BC)-based OSB manufacturers want to know how they might best handle an expected flood of low-quality post-MPB wood in their operations. However, the technical and economic feasibility of milling the wood specifically for this purpose remains to be determined. As with lumber production, the MPB wood has a major effect on value for oriented strandboard plants. Few researchers have looked at the effects of processing beetle, fire and storm-damaged wood on the processing of OSB (Maloney, et al. 1976 and Maloney 1981). Although not specifically looking at beetle- or fire-killed timber, the most relevant published study for increasing wood recovery in OSB would be a recent Forintek/Alberta Research Council (ARC) evaluation of the effect of log moisture content (Knudson and Chen 2001). That study showed that the amount of fines nearly doubled when stranding logs dried to an average 50% moisture content as compared with stranding fresh logs. Since the average moisture content of MPB wood can go below 20%, the amount of fines would be expected to be much higher. As the amount of fines increases, the OSB property values decrease, wood recovery decreases, and the amount of resin required increases, thereby increasing product manufacturing costs. There are two BC OSB plants and a third under construction in the heavily infested area that could process beetle-killed wood. If the two currently operating OSB plants were to use beetle-killed timber for 50% of their wood requirements they could use approximately 600,000 m^3 of this wood per year. When the third plant comes on stream the amount could jump to 1,000,000 m^3. Based on data derived in the Forintek/ARC log moisture content and fines studies (Knudson and Chen 2001), savings of approximately $0.7 million per plant per year are expected through reduced wood and resin costs if impacts of low log moisture content wood on OSB manufacture can be reduced or reversed.

Although grey stage logs are dry, recent work at Forintek has shown significantly increased permeability and wettability of blue-stained beetle-killed sapwood (McFarling and Byrne 2003). Taking advantage of the rapid uptake of water by this material, it might be feasible to sprinkle logs prior to processing into OSB strands. (Submerged water storage, which would probably be more effective, is not a feasible operation at the OSB plants that would receive this material.) Water vat conditioning is already a normal part of the operation of OSB plants and it is possible that modifications to normal practice can result in improved yield of strands. It has been well established that wood can be impregnated with liquids by vacuum-pressure treatment. It is an

effective technique to saturate wood with water, which represents the extreme case of wetting the dry logs and sets the ultimate that can be achieved.

2 Material and Methods

2.1 Material

Grey stage MPB logs (standing dead for 20 years), green lodgepole pine logs and green aspen logs were used for this study. The following logs were shipped to the Forintek western laboratory from the Ainsworth OSB mill in 100 Mile House, B.C.:

a) beetle-killed lodgepole pine from the 1980 outbreak – fifty 10-foot long logs of 7" to 11" (18 cm to 28 cm) in diameter. These logs were separated into two piles of similar diameters for the strander set-up tests and log storage tests.
b) green pine – ten 10-foot long logs of 7" to 11" (18 to 28 cm) in diameter.
c) aspen – ten 10-foot long logs of 6" to 11" (15 to 28 cm) in diameter.

2.2 Test Methods

The study included:

- Strander Set-up Tests

The stranding was done on a pilot scale strander (drum cut strander) at Carmanah Design and Manufacturing Inc. Four different counter-knife angles (50°, 60°, 70° and modified 70°) were examined for MPB logs after water vat conditioning at 15°C for 6 hours. In the modified counter-knife set-up the counter-knife was set back from the knife tips an additional 1/16" (1.6 mm) compared to the normal 1/8" (3.2 mm) set back used for the other test conditions. The intended result was a less aggressive counter-knife arrangement. Twenty log samples were used for each strander set-up condition. Density and moisture uptake and distribution in the logs were measured at the time of stranding. Screening and strand geometry analyses were carried out to measure strand quality. Eighty 2-foot (610 mm) long beetle-killed logs were used in this experiment.

- Log Storage Tests

The control was logs in a dry condition as received plus water vat conditioning. The tests involved sprinkled storage plus water vat conditioning. The sprinkling was done for three different time periods (10, 20 and 30 days respectively) prior to water vat conditioning at 15°C for 6 hours. Twenty log samples were used for each condition. Density and moisture uptake and distribution in the logs were measured at the time of stranding. A counter-knife angle of 50° was used for the strander. Screening and strand geometry analyses were carried out to measure strand quality and recovery of OSB quality strands. Eighty 2-foot long beetle-killed log samples were used in this experiment.

For comparisons, twenty 2-foot long green pine log samples and twenty 2-foot long green aspen log samples were also tested without sprinkling but with water vat conditioning at 15°C (60°F) for 6 hours in this experiment.

- Vacuum-Pressure Treatment

Seven 2-foot long beetle-killed log samples were cut. The log samples were submerged in water at approximately 20°C in a vacuum chamber and subjected to a vacuum at about 22-inch Hg for 0.5 hour, followed by a pressure of about 150 psi for one hour. The treated log samples were then stranded using a counter-knife angle of 50° and tested for strand quality. Density and moisture uptake, and distribution in the logs were measured at the time of stranding. Screening and strand geometry analyses were carried out to measure strand quality and recovery of OSB quality strands.

2.3 Material Preparations and Measurement

2.3.1 Log Sample Preparations

2.3.1.1 Strander Set-up Tests

For the strander set-up tests, eighty 2-foot long beetle-killed log samples were cut from 20 grey logs. Each log was cut into four 2-foot pieces with a foot on either end as waste. In the center of each log two disks were cut – one for density and moisture content and the other for moisture gradient analysis. The four individual 2-foot log samples were labelled as 1, 2, 3 and 4 starting from the butt end of the log. Each log segment was brush end-sealed on both ends with a wax-based sealant, as shown in Figure 1. Four matched groups, of 20 log samples each, were separated from these 80 samples for four different strander set-up conditions, as shown in Table 1.

Figure 1 End-sealed 2-foot long samples

Table 1 Sample identifications for the strander set-up tests

Log #	Set 1 50° counter-knife angle	Set 2 60° counter-knife angle	Set 3 70° counter-knife angle	Set 4 Modified 70° counter-knife angle
1	1-1	1-2	1-3	1-4
2	2-2	2-3	2-4	2-1
3	3-3	3-4	3-1	3-2
4	4-4	4-1	4-2	4-3
5	5-1	5-2	5-3	5-4
6	6-2	6-3	6-4	6-1
7	7-3	7-4	7-1	7-2
8	8-4	8-1	8-2	8-3
9	9-1	9-2	9-3	9-4
10	10-2	10-3	10-4	10-1
11	11-3	11-4	11-1	11-2
12	12-4	12-1	12-2	12-3
13	13-1	13-2	13-3	13-4
14	14-2	14-3	14-4	14-1
15	15-3	15-4	15-1	15-2
16	16-4	16-1	16-2	16-3
17	17-1	17-2	17-3	17-4
18	18-2	18-3	18-4	18-1
19	19-3	19-4	19-1	19-2
20	20-4	20-1	20-2	20-3

2.3.1.2 Log Storage Tests

For the log storage tests, eighty 2-foot long beetle-killed log samples were cut from 20 grey logs (four samples from each log and labelled as A, B, C and D). Four matched groups were separated from these 80 samples for four different sprinkling conditions (0, 10, 20 and 30 days). Twenty 2-foot long green pine logs and twenty 2-foot long green aspen logs were also cut. Table 2 shows the identification of log samples in each matched group of the log storage tests.

2.3.1.3 Vacuum-Pressure Tests

For the vacuum-pressure tests, seven 2-foot long beetle-killed log samples were cut. Identification of MPB log samples in the vacuum-pressure tests are also included in Table 2. Overall, a total of 207 log samples of 2-foot length were cut for all three experiments.

Table 2 Sample Identifications for the log storage tests and vacuum-pressure tests

Log #	Set 1 Sprinkling for 0 day	Set 1 Sprinkling for 10 days	Set 1 Sprinkling for 20 days	Set 1 Sprinkling for 30 days	Green Aspen	Green Pine	MPB Logs vacuum-pressure treatment
1	1-A	1-B	1-C	1-D	A1-1	P1-1	V1
2	2-B	2-C	2-D	2-A	A1-2	P1-2	V2
3	3-C	3-D	3-A	3-B	A1-3	P1-3	V3
4	4-D	4-A	4-B	4-C	A1-4	P1-4	V4
5	5-A	5-B	5-C	5-D	A2-1	P2-1	V5
6	6-B	6-C	6-D	6-A	A2-2	P2-2	V6
7	7-C	7-D	7-A	7-B	A2-3	P2-3	V7
8	8-D	8-A	8-B	8-C	A2-4	P2-4	
9	9-A	9-B	9-C	9-D	A3-1	P3-1	
10	10-B	10-C	10-D	10-A	A3-2	P3-2	
11	11-C	11-D	11-A	11-B	A3-3	P3-3	
12	12-D	12-A	12-B	12-C	A3-4	P3-4	
13	13-A	13-B	13-C	13-D	A4-1	P4-1	
14	14-B	14-C	14-D	14-A	A4-2	P4-2	
15	15-C	15-D	15-A	15-B	A4-3	P4-3	
16	16-D	16-A	16-B	16-C	A4-4	P4-4	
17	17-A	17-B	17-C	17-D	A5-1	P5-1	
18	18-B	18-C	18-D	18-A	A5-2	P5-2	
19	19-C	19-D	19-A	19-B	A5-3	P5-3	
20	20-D	20-A	20-B	20-C	A5-4	P5-4	

2.3.2 Debarking

All log samples were debarked after water sprinkling and before vat water soaking.

2.3.3 Water Conditioning

Figure 2 shows how water sprinkling was done at Forintek:

- sprinkling time: 30, 20, 10 and 0 days (started with sample set of 30-days sprinkling first, followed by 20-days and then 10-days so that stranding could be done for all sample sets at about the same time)
- sprinkling temperature: 15°C
- vat conditioning temperature: 15°C
- vat conditioning time: 6 hours

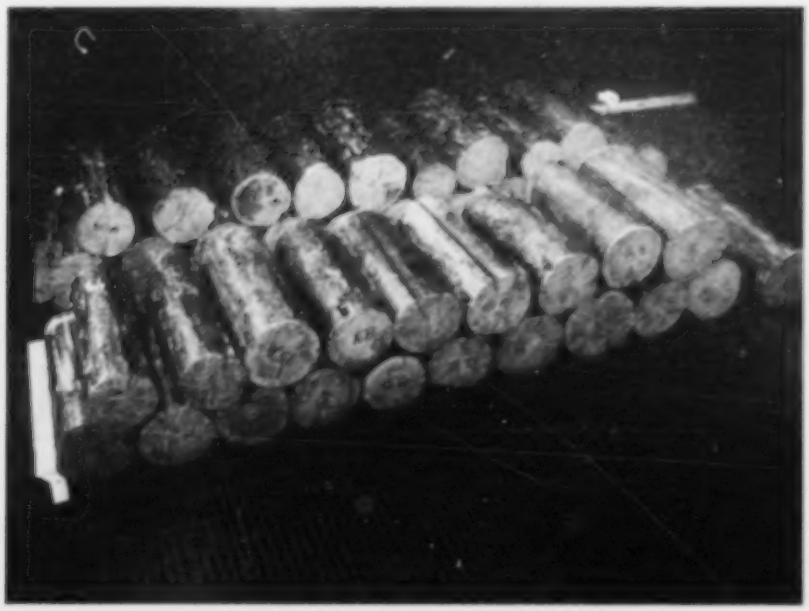

Figure 2 Water sprinkling on 2-foot MPB log samples

2.3.4 Stranding

Figure 3 shows the cross-section of a drum strander, which illustrates how stranding is accomplished by rotation of knife packages. Figure 4 illustrates knives and counter-knife setting of each knife package inside a drum strander.

Stranding was carried out on the Carmanah lab drum strander (see Figure 5). Knives were 12-inches (305 mm) long, mounted in the strander ring to cut into the log. Two scoring knives were used to cut 4-inch (102 mm) long strands. A single 12-inch long cutting pass was made through each log. After each log the strander was halted and furnish from the one cutting pass was collected and separately bagged. Each bag was labelled with the log segment identification number. Care was taken to collect all strands and fines generated by the strander from the one cutting pass. Two moisture content sample disks approximately 1-inch (25 mm) thick were cut from the end next to the stranded portion of the log segment of the remaining one-foot section of each log. One sample disk was oven dried to determine log moisture content and density. The other sample disk was used for determining moisture gradient. The moisture content sample disks were also used to measure log diameter.

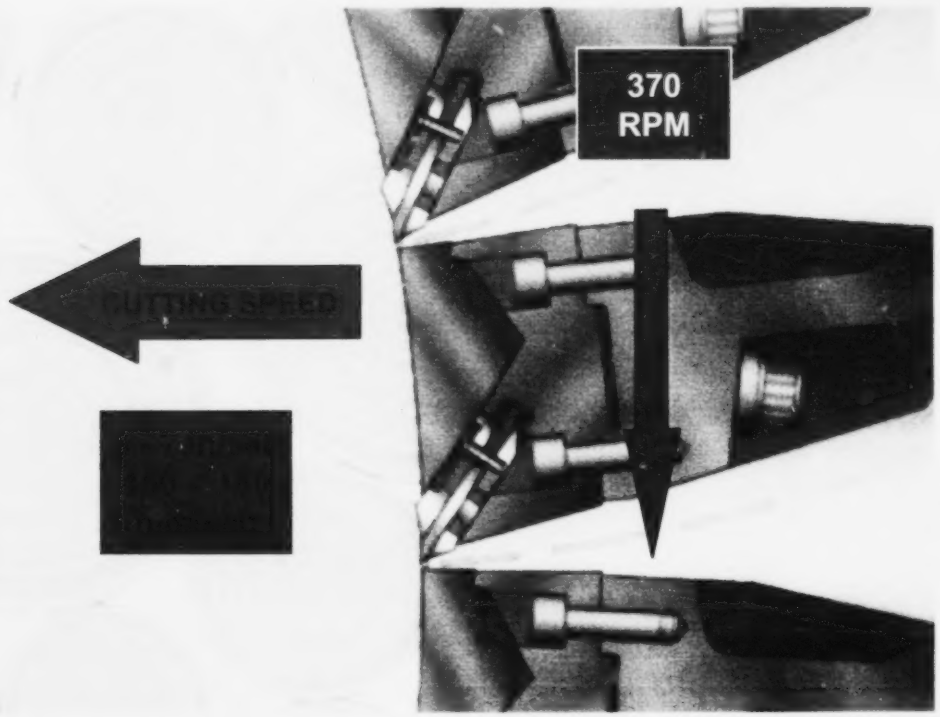

Figure 3 Strander cross-section

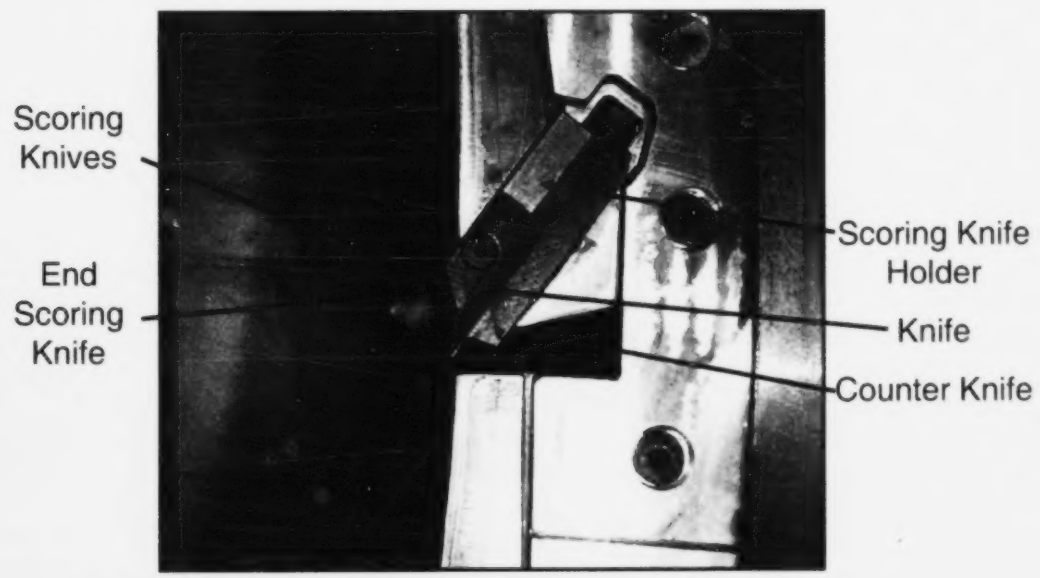

Figure 4 Knives and counter-knife set-up inside the strander

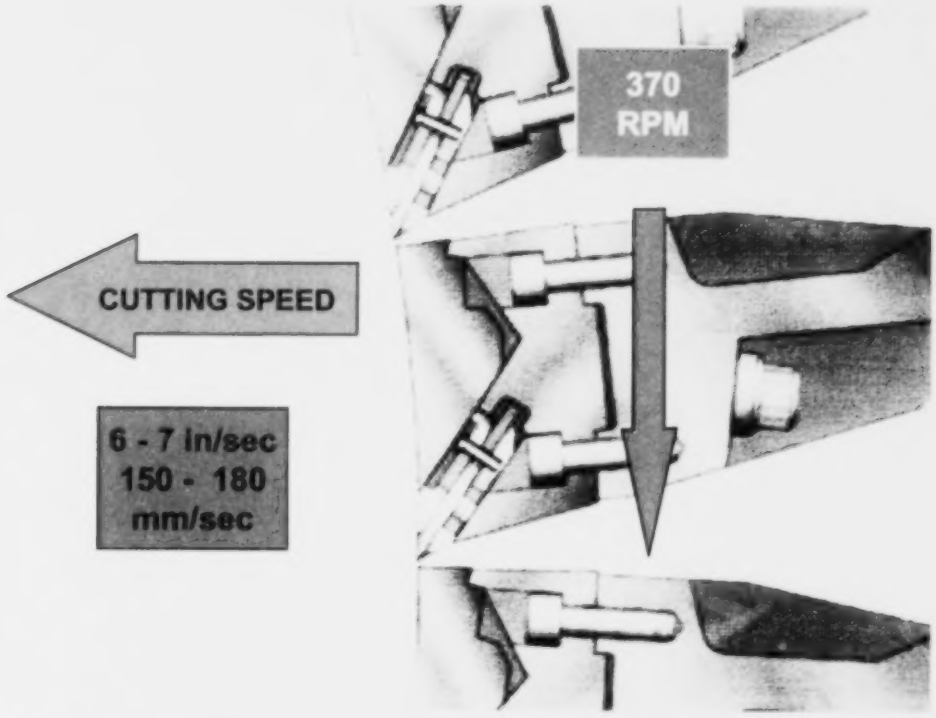

Figure 3 **Strander cross-section**

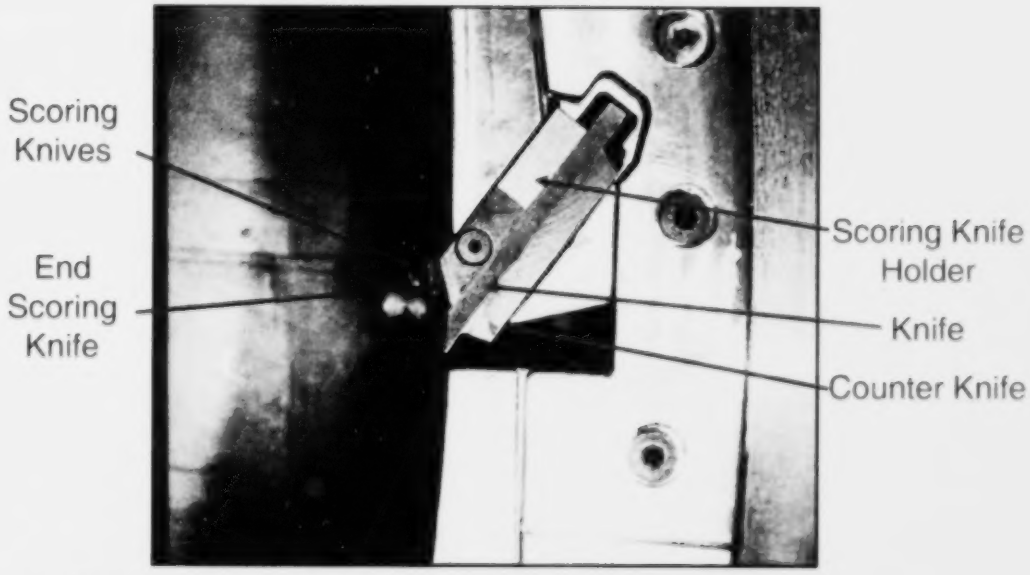

Figure 4 **Knives and counter-knife set-up inside the strander**

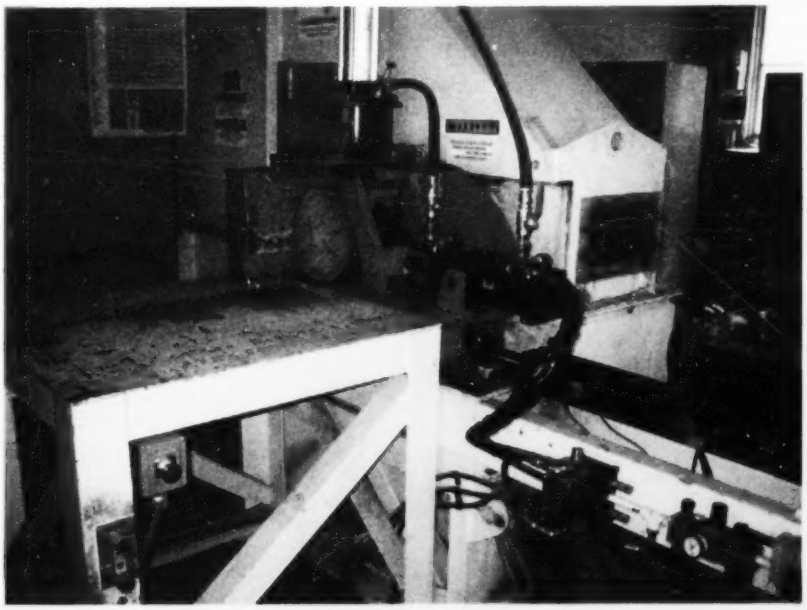

Figure 5 Carmanah laboratory drum strander

2.3.5 Screening

Screen analyses were carried out at Carmanah. The strands collected from each log segment were placed on the floor and mixed with a pitchfork to give a mat of strands with an even consistency. This produced an even horizontal distribution of strands. Three samples of strands (labelled as A, B and C) for screening were taken by pulling out vertical sections of appropriate size from the strand mat. Therefore, 60 screen analyses were performed for each matched group of MPB log samples. Screened fractions were weighed to the nearest gram and screen recoveries were calculated as a percentage of the total weight of strands screened from the overall sample. A Gilson screen equipped with wire mesh decks of 1.5", 1.25", 1", 0.75", 0.5", 0.25" (38.1, 31.8, 25.4, 19.0, 12.7, 6.4 mm) and a pan was used first. Material collected on the bottom pan of the Gilson screen was then classified on a Williams Classifier equipped with round punch plate decks of 0.25" (6.4 mm) and a pan. Screening times were 10 minutes on the Gilson screen and three minutes on the Williams Classifier. The Gilson screen operates with a vertical motion that tends to classify strands by width. Strands less than ¼" wide and of varying lengths were able to pass through the ¼" deck of the Gilson screen onto the bottom pan. The Williams Classifier operates on a horizontal-circulatory motion that tends to classify by length. The result of the dual screening operation is that the material ending up on the bottom pan of the Williams Classifier is the finest material. Material collected on the top of the screen of the Williams Classifier was classified as fines and the material that passed through the screen was classified as pan.

A total of 621 screen analyses were performed, from which 4968 furnish fractions were examined. After the screen analyses were completed, all fractions of strands were classified, bagged, labelled and sent to Forintek's western laboratory for optical analysis of strand geometry.

2.3.6 Optical Analysis of Strand Geometry

Fractions of different strand size were obtained from the screen analyses. Image analysis was performed to measure the distribution of strand length and width. Strand shapes were also evaluated visually. Before picking the samples for strand geometry analyses, the bags were tumbled around by hand to ensure that the strands were well mixed and that representative samples were taken from each bag.

Approximately 200 strands were picked for length and width measurements from a bag of sample strands. Strand length and width were measured with an image analysis system in which a video camera captured the strand images, and software called Optimas® was used to collect data and measure strand dimensions. The camera's field of view was set to cover an area of 16" x 22" in which strands were evenly laid without any overlapping. A dark coloured cloth was used as the background to enhance the contrast of the strand images. After setting the proper threshold to differentiate the strands and background, images of strands were captured and the length and width of individual strands were recorded. The minimum dimension that the image analysis system with this particular configuration could handle was in the range of 0.05" to 0.06" (1.3 to 1.5 mm).

2.3.7 Moisture and density distributions

Moisture and density distributions were measured at the time the logs were initially bucked into 2-foot segments and again immediately after stranding. Two 1-inch (25 mm) disks were cut from the centre sections of the logs after bucking and two 1-inch disks were cut from the remaining 1-foot piece after stranding. Sampling procedures are described in previous sections. From each pair of disks, one was used for overall moisture content and density determination, and the other was used to determine moisture and density gradient.

- Sample size: 1-inch thick log disk
- Sampling time: during bucking of logs into four segments and after stranding
- Method for moisture determination: oven dry
- Method for density determination: water submersion

For overall moisture and density determination the entire disk was weighed immediately, immersed in water to determine its volume, and then oven dried to determine oven-dry weight. For moisture and density gradient samples the disks were cut into 1" x 1" (25 x 25 mm) samples across the disk diameter (Figure 6). The samples were individually weighed, immersed in water to determine volume, and then oven dried to determine oven weight. Moisture content and density at the time of sampling were then calculated.

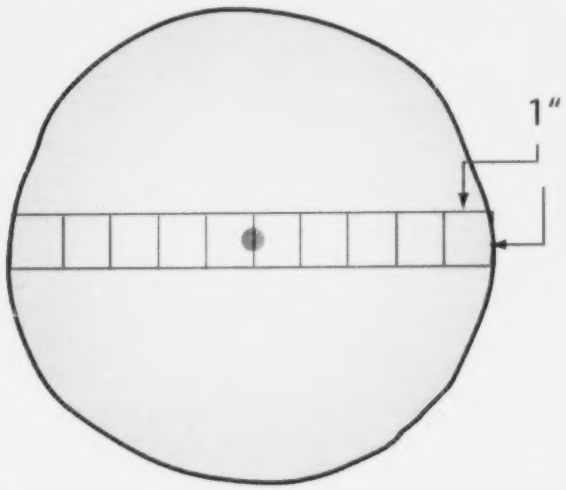

Figure 6 Samples for moisture and density gradient determination

3 Results and Discussion

3.1 Properties of Grey Stage MPB Wood

The grey stage MPB logs used in the tests had very little bark, heavy blue stain in the sap wood area and lots of checks, as shown in Figure 7. From a panel product manufacturing point of view, grey stage beetle-killed lodgepole pine can be considered as a new type of wood material due to its dryness, brittle nature, blue stain and high permeability. Some properties of the MPB logs, in comparison with the green aspen logs and green lodgepole pine logs used in this study, are summarized in Table 3.

Figure 7 Grey stage MPB logs (standing dead for 20 years)

Table 3 Properties of Grey Stage MPB Wood, Green Pine and Green Aspen

Log Type	Bark	Checks	Log Diameter (inches)	Moisture %	Density (green, lbs/ft³)	Density (green, g/cm³)	Density (O.D. g/cm³)
MPB Wood	little	large, bark to pith	9.65	21.7	33.89	0.543	0.447
Green Pine	largely intact	little	8.44	38.6	38.28	0.613	0.443
Green Aspen	largely intact	little	9.30	61.4	36.57	0.586	0.364

The data in Table 3 are the average values from forty MPB logs, five green pine logs and five green aspen logs, respectively. Among the three types of wood, MPB wood had the lowest moisture content (21.7%) while green pine contained nearly twice as much moisture (38.6%) and green aspen nearly three times as much moisture (61.4%) as that of the MPB wood. For this reason, the MPB wood showed about 12% lower green density than that of green pine and about 7% lower green density (as received and tested) than that of green aspen. This may be positive in terms of transportation cost of MPB wood. The fact that grey stage MPB wood has very little bark may also contribute positively to the cost of debarking and debarking efficiency in the OSB mills. The MPB wood showed almost the same dry density as that of green pine and about 23% higher dry density than that of the aspen. This suggests that higher OSB product density may be required from MPB wood to achieve the same bonding strength as that of aspen because of different compression ratios for mat consolidation and panel pressing. Higher panel density would likely increase transportation costs.

It is also noteworthy that the average MPB log diameter was large. This may affect the resulting strand size when using the lab strander. Because the lab strander is much smaller than an industrial strander of similar type, large log diameters could yield more large size strands than expected. Strand size (width) in this study was larger than anticipated for MPB wood.

3.2 Strander Set-up Tests

Counter-knife angle is a key factor in determining strand size. Wood species also has great influence on the outcome of strand production. In order to minimize the generation of fines during stranding, MPB wood may require a counter-knife angle that is different from that being used for aspen or southern yellow pine. Therefore, this part of the study was to principally examine the effect of counter-knife angles on the generation of fines during MPB wood stranding.

Most of these logs showed relatively even moisture gradients, as determined before water vat conditioning (see moisture gradient data in Appendix I). They gave moisture contents mostly between 15% and 25%. Derived from the moisture gradient data, Figure 8 illustrates the maximum, minimum and average moisture contents of each log. For each log the average MC value represents the moisture content of the one disk measured in its entirety, while the maximum and minimum MC values came from the 1" x 1" samples cut from the other disk for determining moisture and density gradients.

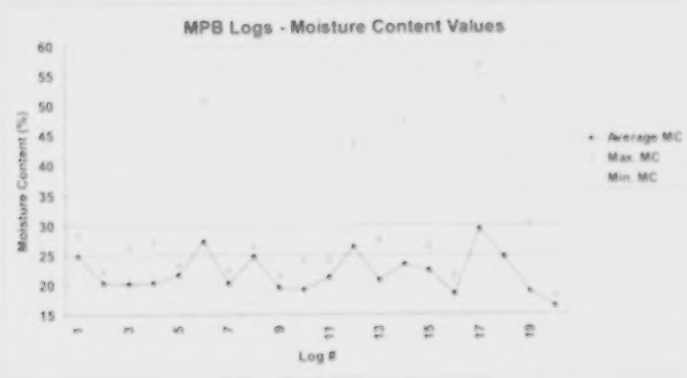

Figure 8 Moisture contents of 20 MPB wood logs before water vat conditioning

Water vat conditioning of logs is a standard practice in OSB production. Moisture gradient across a log section was determined for each log sample after vat conditioning (a total of 665 MC samples). These moisture gradient data clearly showed that vat conditioning is only effective in increasing moisture to the outermost portion of a log (see Table 4 and moisture gradient data in Appendix I). They strongly suggest that there is room for improvement in the area of log conditioning, which could lead to a substantial increase in wood recovery and productivity. Table 4 shows how moisture contents of the MPB log samples changed after water vat conditioning at 15°C for 6 hours. Overall, the moisture content increased an average of 7.6%. The moisture content of the outer 1-inch section of the MPB logs was raised to 35.0% while the moisture of the inner sections remained at 20.7% on average.

Table 4 Moisture contents and moisture gradients before and after vat conditioning

Test Group	Moisture % (before)[1]	Moisture % (after)[2]	Moisture %, outer 1-inch (after)[2]	Moisture %, innermost sections (after)[2]
50° CKA[3]	23.8	33.0	36.3	20.9
60° CKA	23.8	32.1	36.0	21.3
70° CKA	23.8	30.7	35.5	20.7
Modified 70° CKA	23.8	29.9	32.2	19.9
Overall Average	**23.8**	**31.4**	**35.0**	**20.7**

[1]Average values from all MPB logs.
[2]Average values from each matched group of MPB log samples.
[3]CKA stands for counter-knife angle.

Three strand samples from each MPB log section were screened into 8 fractions of different sizes (1.5", 1.25", 1", 0.75", 0.5", 0.25", fines and pan), as shown in Figure 9. Strand size distributions derived from each counter-knife angle are illustrated in Figure 10, 11, 12 and 13, respectively. To better compare these strand size distributions, they are illustrated together in Figures 14, 15 and 16. All data from the screen analyses of the strander set-up tests are attached in Appendix I.

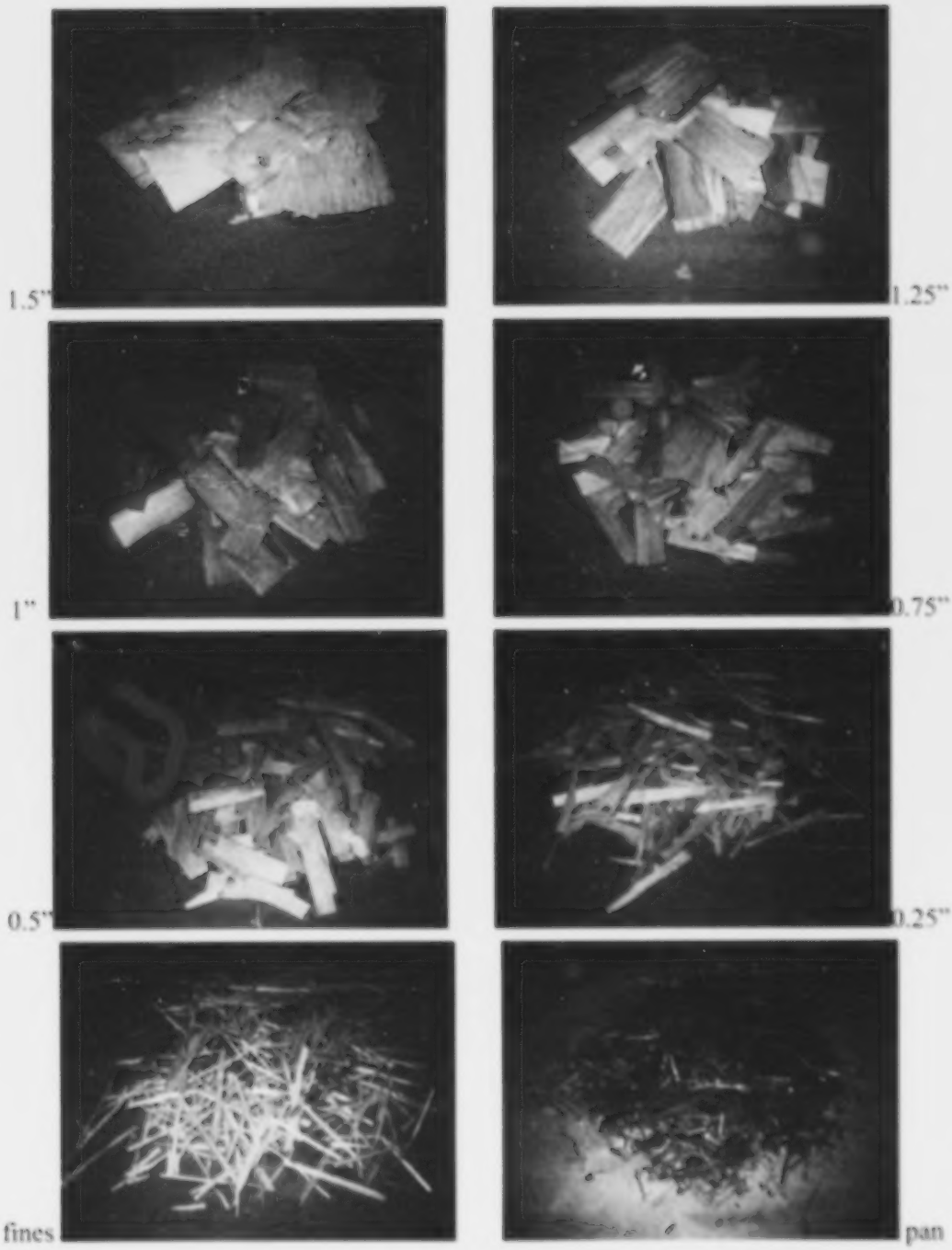

Figure 9 Screen fractions of different sizes from an MPB wood strand sample

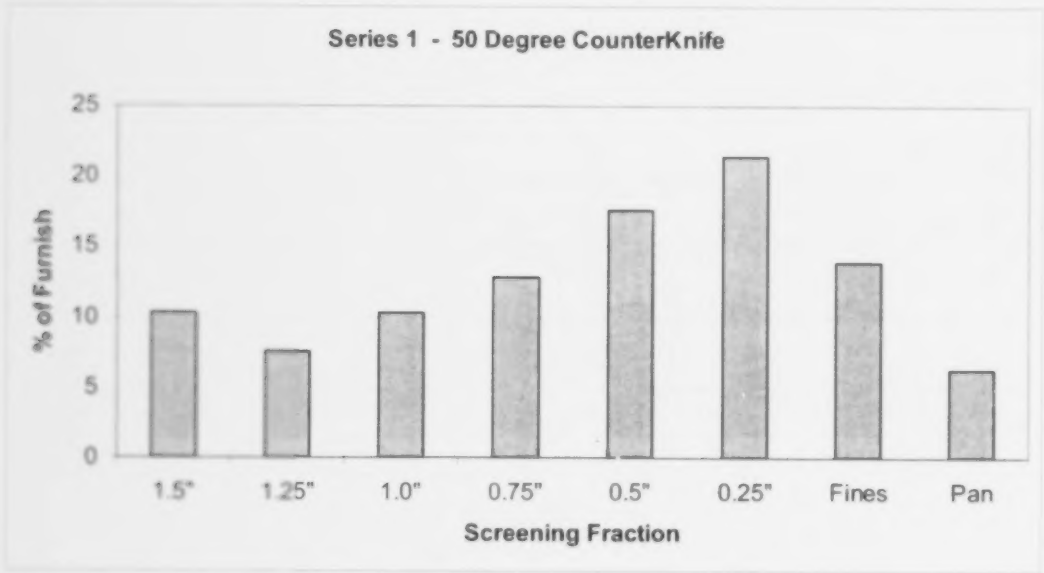

Figure 10 Strand size distribution derived from 50° counter-knife angle

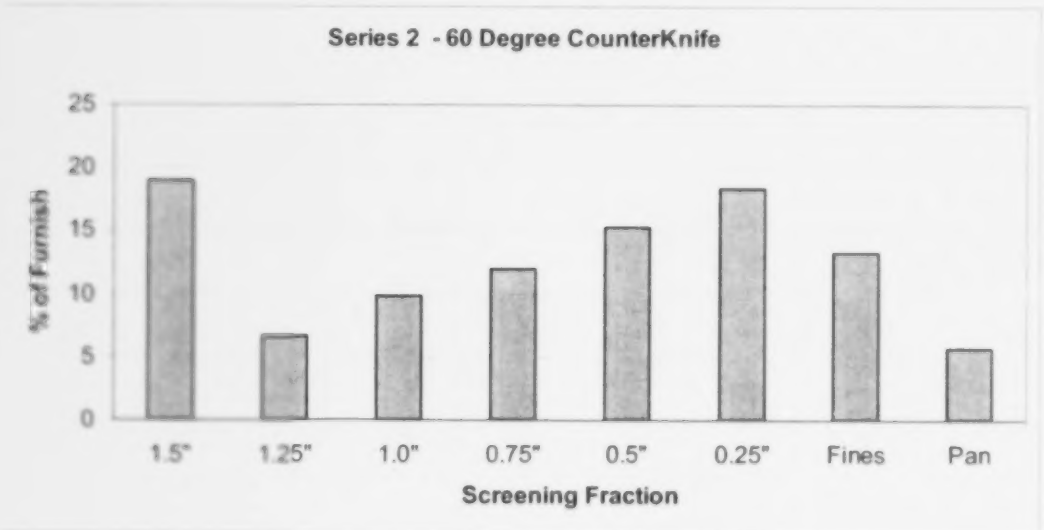

Figure 11 Strand size distribution derived from 60° counter-knife angle

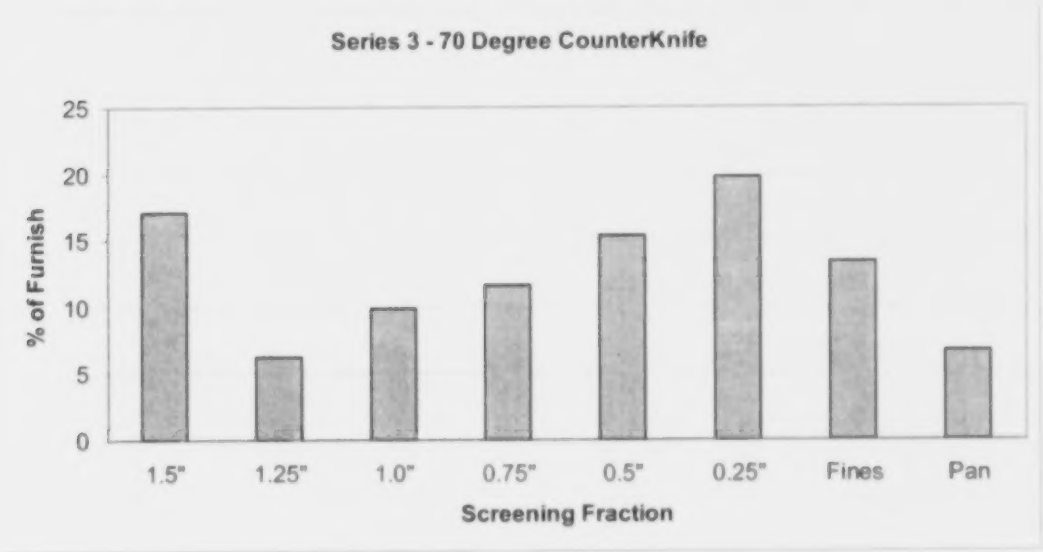

Figure 12 Strand size distribution derived from 70° counter-knife angle

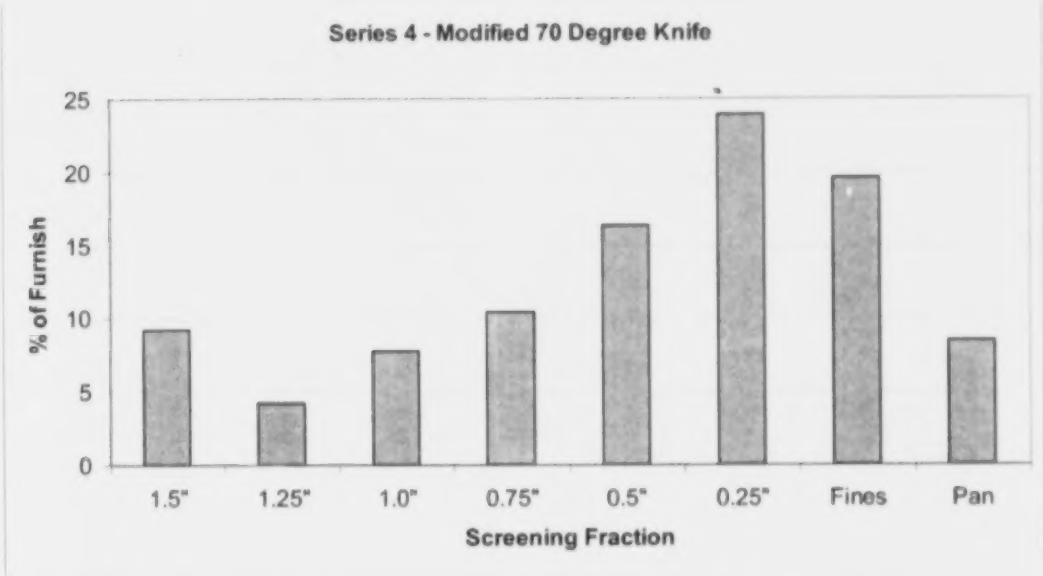

Figure 13 Strand size distribution derived from modified 70° counter-knife angle

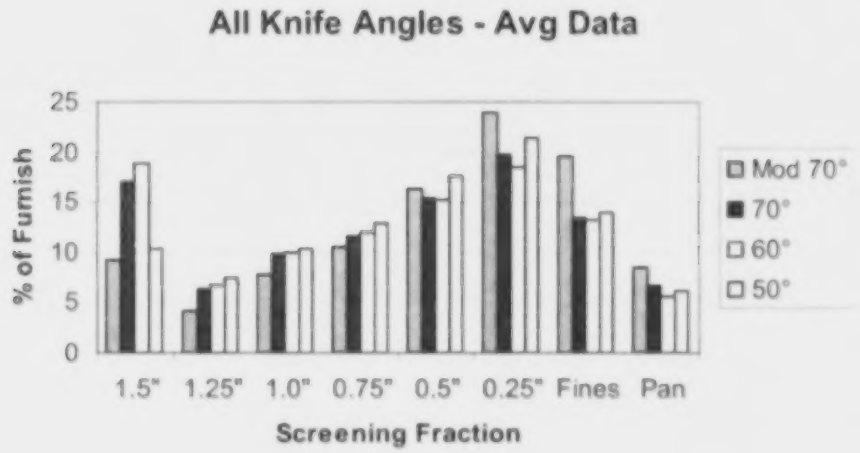

Figure 14 Strand size distributions derived from different counter-knife angles

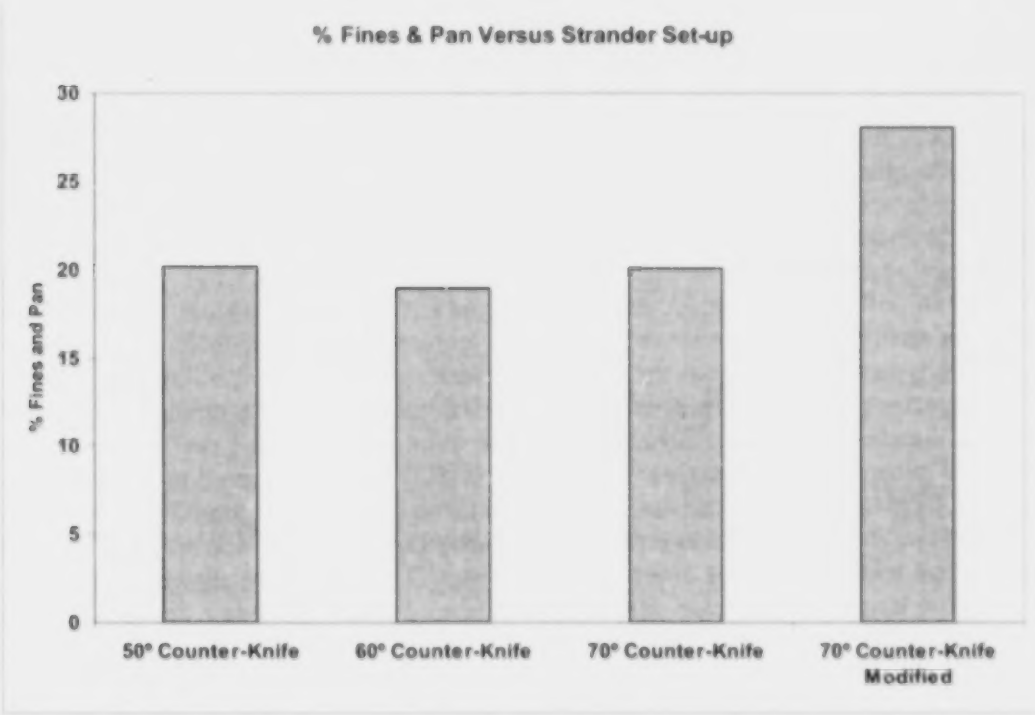

Figure 15 Percent of fines and pan vs. counter-knife angle

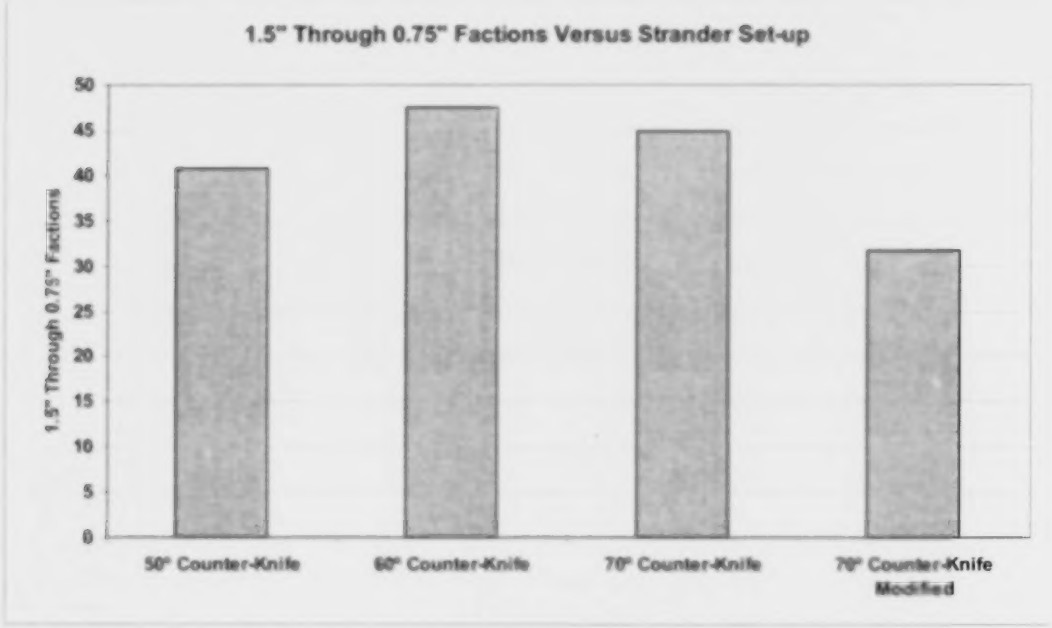

Figure 16 Screen fractions of 1.5" through 0.75" vs. counter-knife angle

As can be seen in Figures 14, 15 and 16, strander knife package set-up can have a significant impact on the strand size distribution. This is particularly the case for the modified 70° counter-knife angle, where significantly more fines and fewer large size strands were generated. However, the differences among the outcomes of 50°, 60° and 70° counter-knife angles were small and not as anticipated based on the experience of Carmanah Design and Manufacturing Inc.'s stranding of aspen and other species (McDonald 2004; Macey 2004). Normal experience has been for strand width to decrease and fines to increase as the counter-knife angle increases. Strand width typically increases as the distance between the counter-knife and knife tip increases. Softwood species like southern pine tend to break more readily during stranding and the industry uses lower counter-knife angles than for aspen to produce strands of the desired widths and reduce fines generation. It is unclear why these trends were not observed in the MPB wood in this study. To investigate this question, each screen fraction of strands derived from 50° and 60° counter-knife angles was analyzed for strand geometry (width, length and area) using an optical image analysis method that was developed at Forintek. The results are shown in Figures 17, 18 and 19. These data again indicate that the difference of strand geometry between 50° and 60° counter-knife angles was very small. It remains to be seen whether the results of this study are representative of all MPB wood, or a characteristic of the particular wood used in this study.

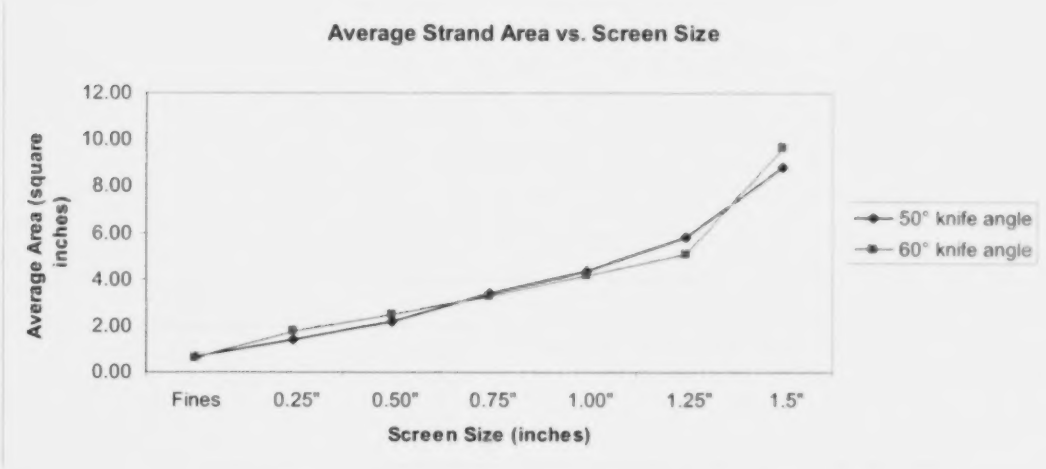

Figure 17 Average strand width *vs.* screen size between 50° and 60° counter-knife angles

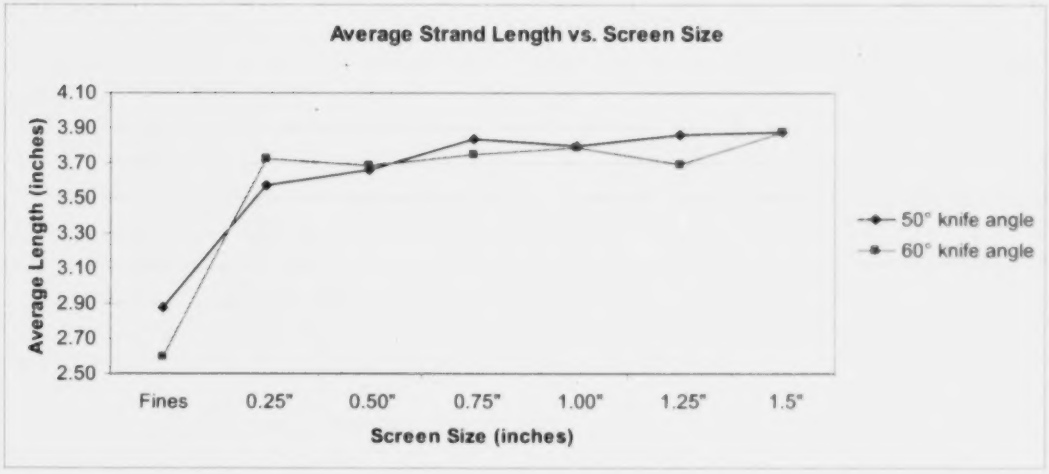

Figure 18 Average strand length *vs.* screen size between 50° and 60° counter-knife angles

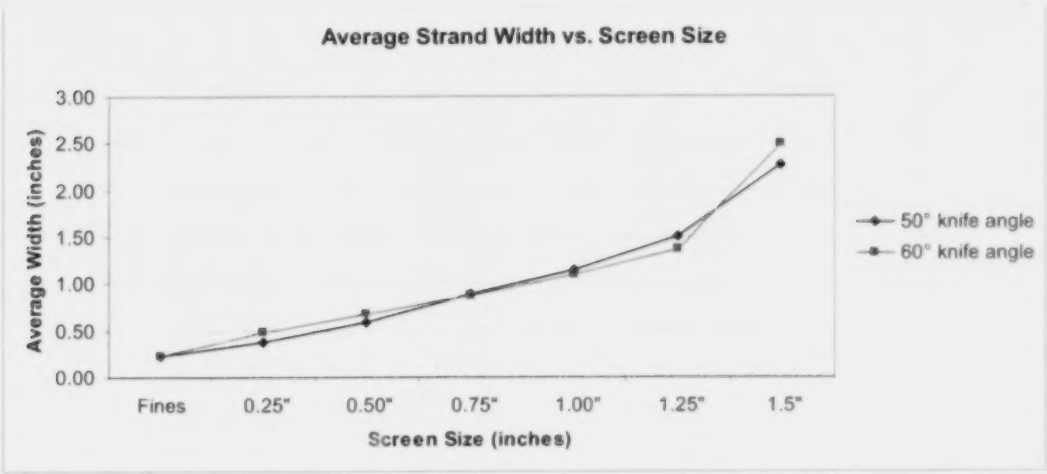

Figure 19 Average strand area *vs.* screen size between 50° and 60° counter-knife angles

3.3 Log Storage Tests

Grey stage MPB wood is dry and brittle. This part of the study examined the effectiveness of water sprinkling on increasing MPB log moisture and reducing fines during strand production. The tests involved sprinkled storage plus water vat conditioning. The control was dry logs as received plus water vat conditioning.

Detailed test data is found in Appendix II. Table 5 and Figure 20 show how the moisture contents of the MPB wood logs changed after sprinkling and vat conditioning. Without sprinkling, vat conditioning alone was able to raise the average moisture content from 19.5% to 30.8%. After 10 days sprinkling, moisture content increased to 48.9%. After 20 days sprinkling, moisture content increased to 59.3%. After 30 days sprinkling, moisture content increased to 61.2%. Clearly, water sprinkling is an effective method in increasing MPB log moisture contents. As illustrated by Figure 20, the data show that almost three-quarters of the moisture gain was already achieved after 10 days sprinkling; 95% of the moisture gain was achieved after 20 days sprinkling; not much more was achieved with additional 10 days sprinkling (30 days).

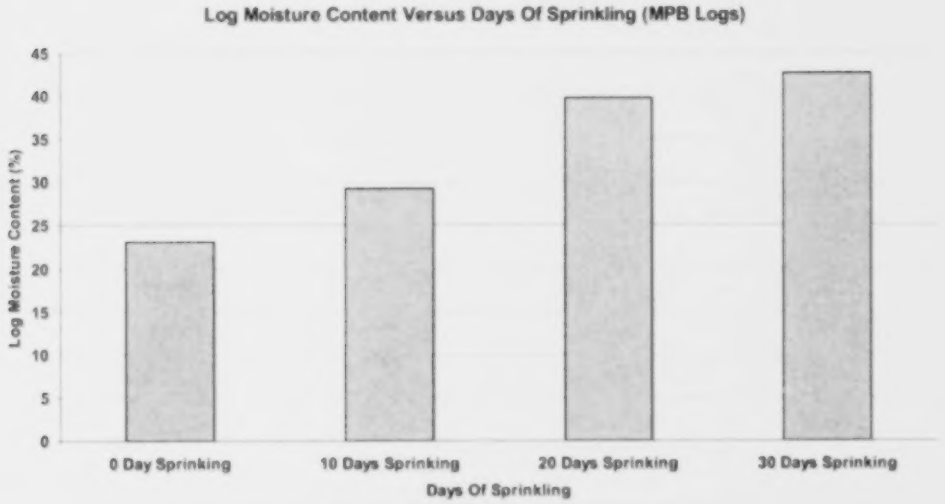

Figure 20 MPB wood log moisture content *vs.* water sprinkling time

Table 5 Moisture content and moisture gradient of MPB logs before and after water sprinkling and vat conditioning

Sprinkling Time	Moisture % (before)[1]	Moisture % (after)[2]	Moisture %, outer 1-inch (after)[2]	Moisture %, innermost sections (after)[2]
0 Day	19.5	30.8	33.8	19.5
10 Days	19.5	48.9	63.9	23.7
20 Days	19.5	59.3	78.9	28.4
30 Days	19.5	61.2	-	-

[1]Average values from all 20 MPB logs
[2]Average values from each matched group of MPB log samples

Moisture gradient was also determined for each log sample after sprinkling and vat conditioning (a total of 788 MC samples) (Table 5, Figure 21). Similar to the observations on vat conditioning described in the strander set-up tests (see Section 3.2), the moisture gradient data showed that water sprinkling is mostly effective in increasing moisture in the outermost portions of the logs (see moisture gradient data in Appendix II for details). The majority of the mass inside a log was considerably less affected by water sprinkling. This phenomenon is illustrated in Figure 21. Blue-stained lodgepole pine sapwood is known to be very permeable to water whereas lodgepole pine heartwood is rated as difficult to impregnate with water and water-borne preservatives. Visually, virtually all of the checks in the logs had closed up after 10 days or longer sprinkling (Figure 22 and 23). Results suggest that there is much potential for improvement in the area of log conditioning – an area where technological innovations could produce substantial benefits.

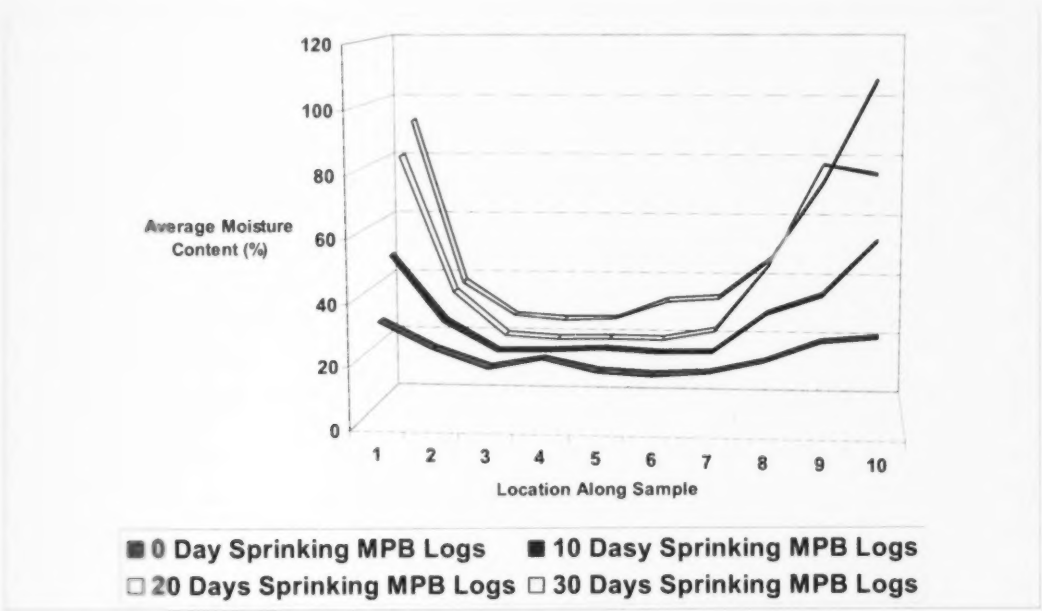

Figure 21 Moisture gradient across MPB log section vs. sprinkling time

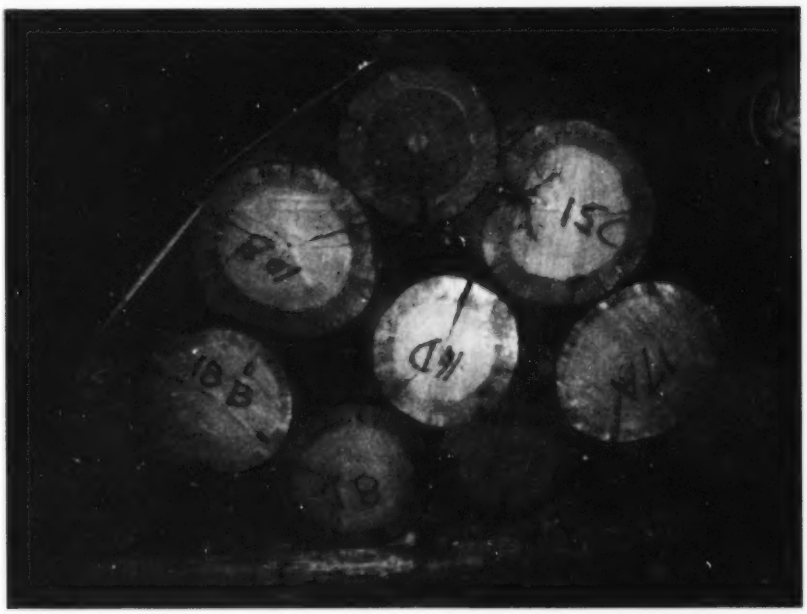

Figure 22 Checking in MPB logs prior to sprinkling

Figure 23 Checks in MPB logs have closed up after 10 days sprinkling

Strand size distributions for the MPB wood after 0, 10, 20 and 30 days of water sprinkling are shown in Figures 24 through 27. For comparison, strand size distributions for green lodgepole pine and green aspen stranded at the same time are shown in Figures 28 and 29.

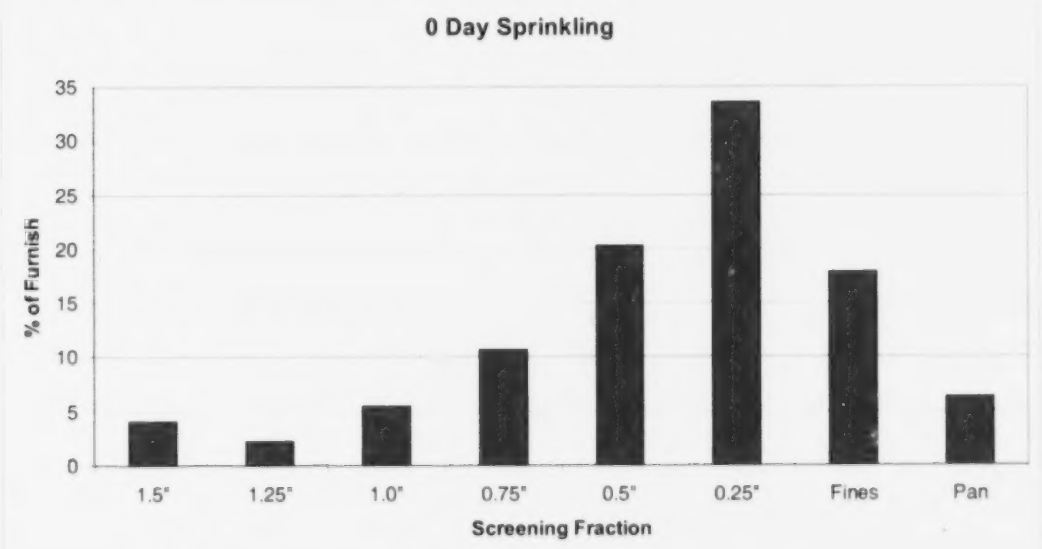

Figure 24 Strand Size distribution without water sprinkling

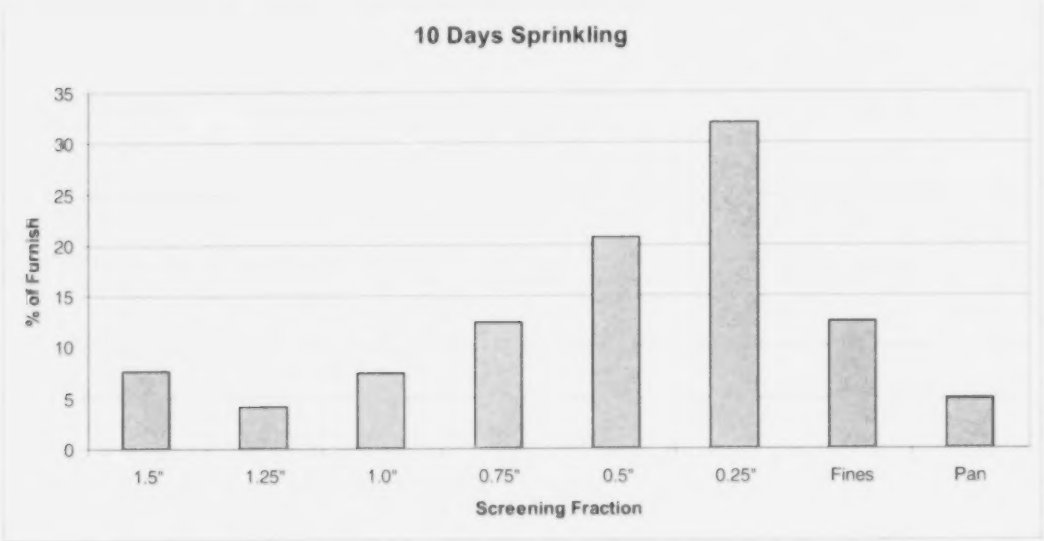

Figure 25 Strand size distribution of MPB wood after 10 days of water sprinkling

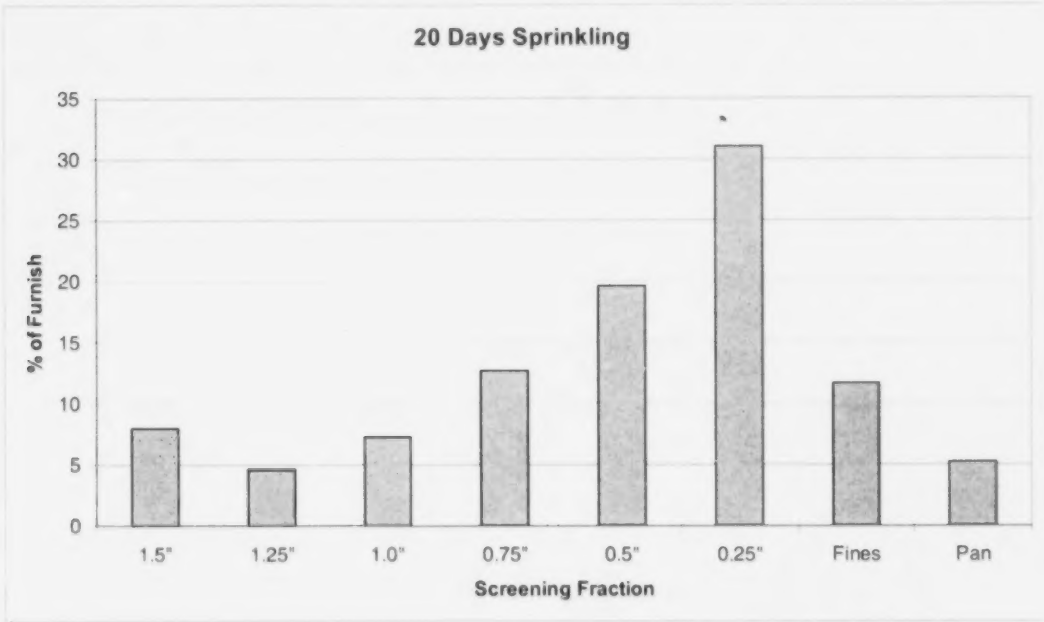

Figure 26 Strand size distribution of MPB wood after 20 days of water sprinkling

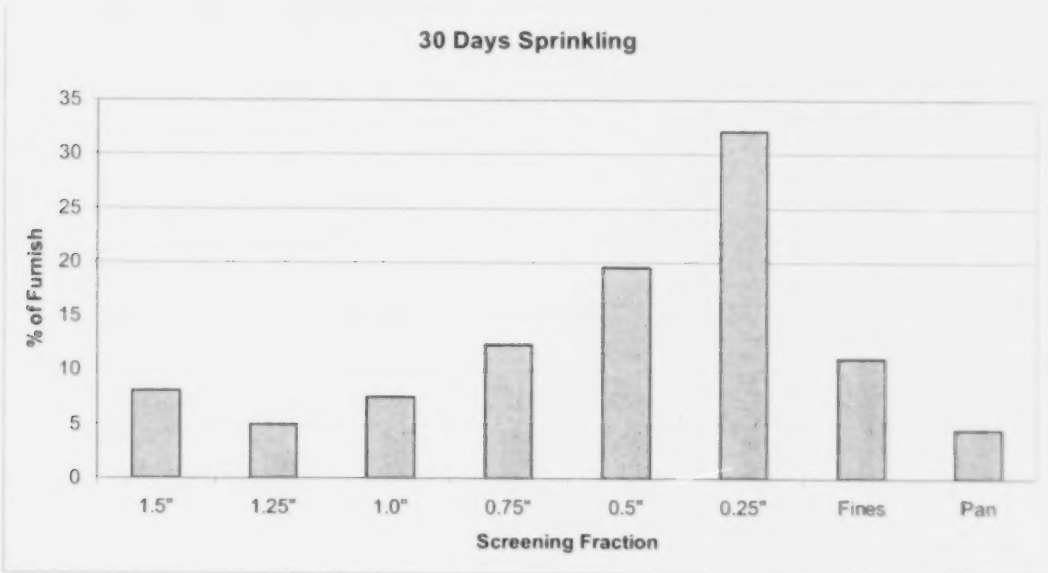

Figure 27 Strand size distribution of MPB wood after 30 days of water sprinkling

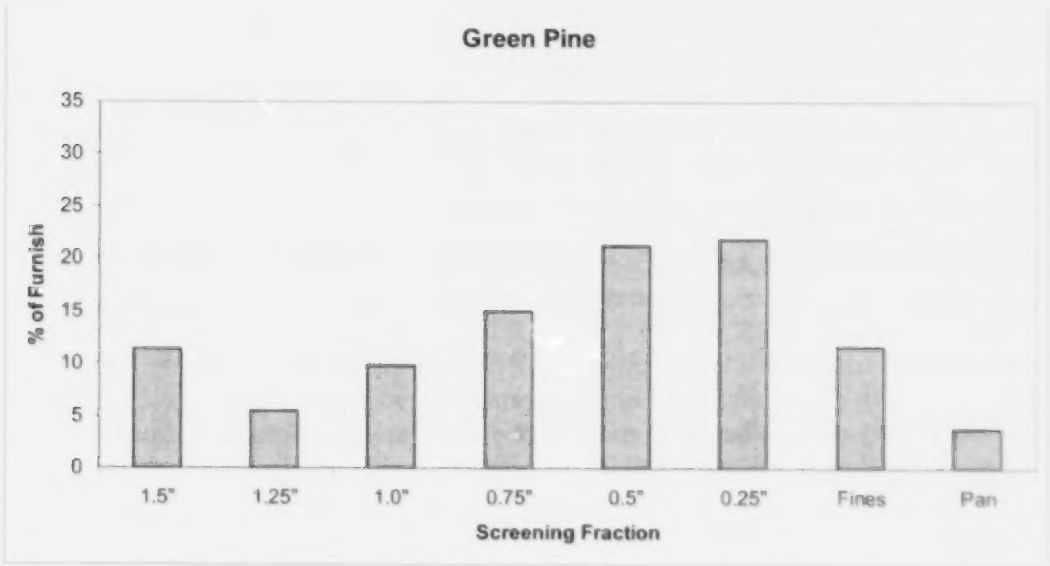

Figure 28 Strand size distribution of green pine

Figure 29 Strand size distribution of green aspen

The patterns of strand size distribution among the four MPB matched groups are similar but somewhat different from those of green pine and very different from those of green aspen. As can be seen in Table 6 and Figures 30 and 31, water sprinkling was clearly an effective method for reducing the production of undesirable small wood flakes and particles (fines and pan) and increasing the proportion of larger strands from MPB logs. Without water sprinkling, the MPB logs produced more fines and fewer large strands than green pine. Despite the moisture gradient data indicating that water sprinkling effectively increased moisture content of only the outer portion of the MPB logs, after 10 days sprinkling, the production of undesirable small wood flakes and particles (fines and pan) was reduced from 24% to about 17%. The production of large strands (screen sizes 1.5" to 0.75") was also increased dramatically from 22% to about 32%. An additional 10 days sprinkling, however, further reduced fines by only about 0.4%. In comparison with 10 days sprinkling, 30 days sprinkling reduced the production of fines by only an additional 1.7% more. Therefore, most of the benefits were already realized after 10 days sprinkling. Interestingly, 30 days sprinkling reduced fines production to a level similar to that of green pine but it still resulted in fewer large strands (screen 1.5" to 0.75") than in green pine. The reason was likely that the MPB logs contained checks. Even though the sprinkling closed these up, the MPB wood was still broken into smaller size strands by the checking. Overall, green aspen produced the least fines and the most large strands.

Table 6 Percentages of different strand size categories from each wood log group

Wood Log Group	Screens 1.5" to 0.75" (%)	Screens 0.5" to 0.25" (%)	Fines + Pan (%)
0 Day Sprinkling	22.18	53.81	24.01
10 Days Sprinkling	31.49	51.27	17.24
20 Days Sprinkling	32.43	50.69	16.88
30 Days Sprinkling	32.89	51.53	15.58
Green Pine	41.47	43.12	15.41
Green Aspen	79.26	16.59	4.15
Vacuum-Pressure on MPB Logs	23.33	56.28	20.39

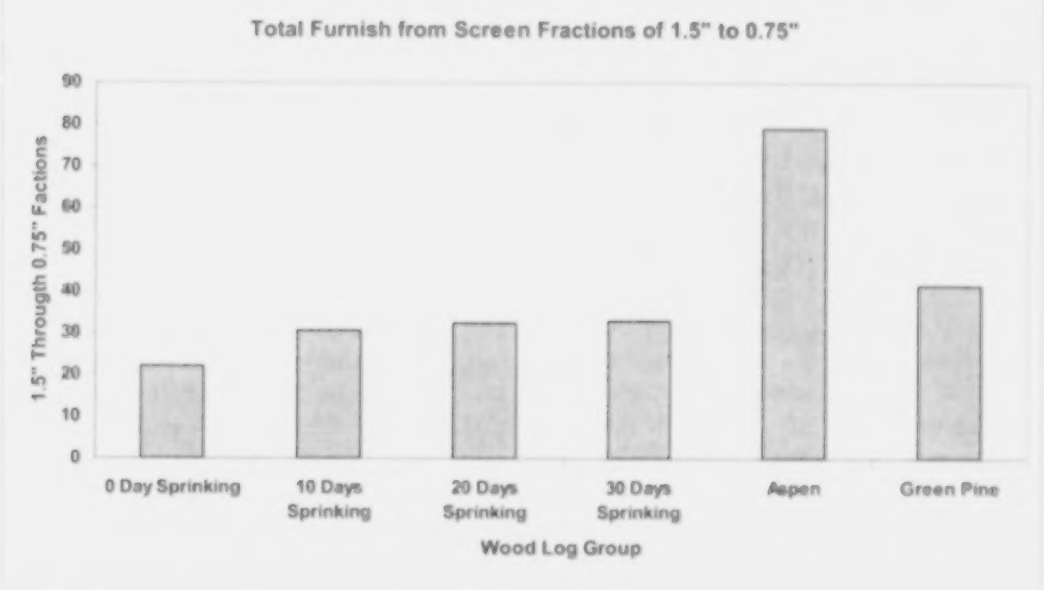

Figure 30 Percentage of larger strands (1.5" to 0.75") from each wood log group

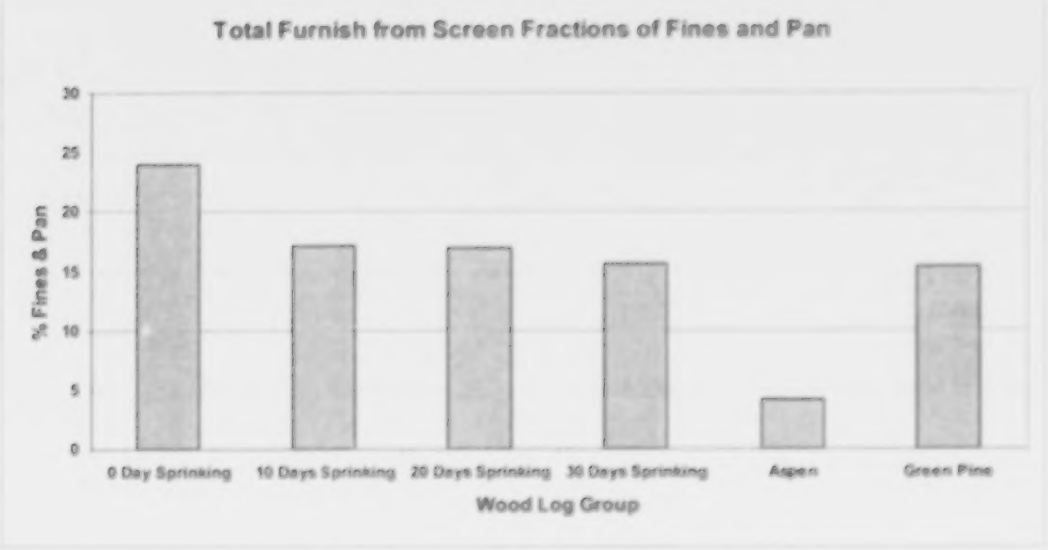

Figure 31 Percentage of small flakes and particles from each wood log group

In relative terms, the generation of fines during stranding of the MPB logs was reduced by 28% after 10 days sprinkling, by 30% after 20 days sprinkling and by 35% after 30 days sprinkling. As a result of water sprinkling, the percentage of larger strands (1.5" to 0.75" screen sizes) was also increased.

The effect of sprinkling for 10, 20 or 30 days should be looked at in relative times rather than absolute terms. The important message is that the addition of moisture to MPB wood will reduce generation of fines and increase the yield of high quality strands. Specific mill scale testing will be required to equate the amount of moisture uptake in log storage piles with the amount of moisture uptake seen in these studies.

3.4 Vacuum-Pressure Treatment

The objective of vacuum-pressure treating dry MPB logs in a water chamber was to examine the effects of extreme hydration on the stranding of these logs. Limited by the scope of this project, only seven MPB log samples of 2-foot lengths were examined.

After being subjected to the vacuum-pressure treatment, the seven water-treated log samples showed average moisture content ranging from 92.7% to 174.1%. The moisture gradient of log sections showed that this treatment effectively increased moisture content of the outer two-inch layer. Moisture contents ranged from below 29% in the core to over 200% in the surface layer. However, as shown by one of the seven log samples, it was possible to introduce moisture into the core of the MPB logs using this kind of treatment.

Figure 32 shows the strand size distribution from these treated MPB logs. The pattern of distribution was similar to that of sprinkled MPB logs. As shown in Table 6, although vacuum-pressure treatment was also effective in reducing the production of fines, it did not seem to be as effective as 10 days of water sprinkling. It appeared to favour the production of mid-size strands

(screen sizes 0.5" to 0.25") over the large strands (1.5" to 0.75"). Although the study size was small, the results were consistent with those from an earlier study of aspen stranded at different moisture contents (Knudson and Chen 2001). In that study, aspen impregnated with water to get a very high moisture content produced relatively few fines, a large volume of mid-size strands, and few wide strands. It was postulated that the greater mass of the very high moisture content strands created more impact when the strands contacted the counter-knife in the strander, causing more breakage of the wood. The results suggested that achieving an intermediate moisture content will provide the greatest improvement in strand quality manufactured from MPB wood.

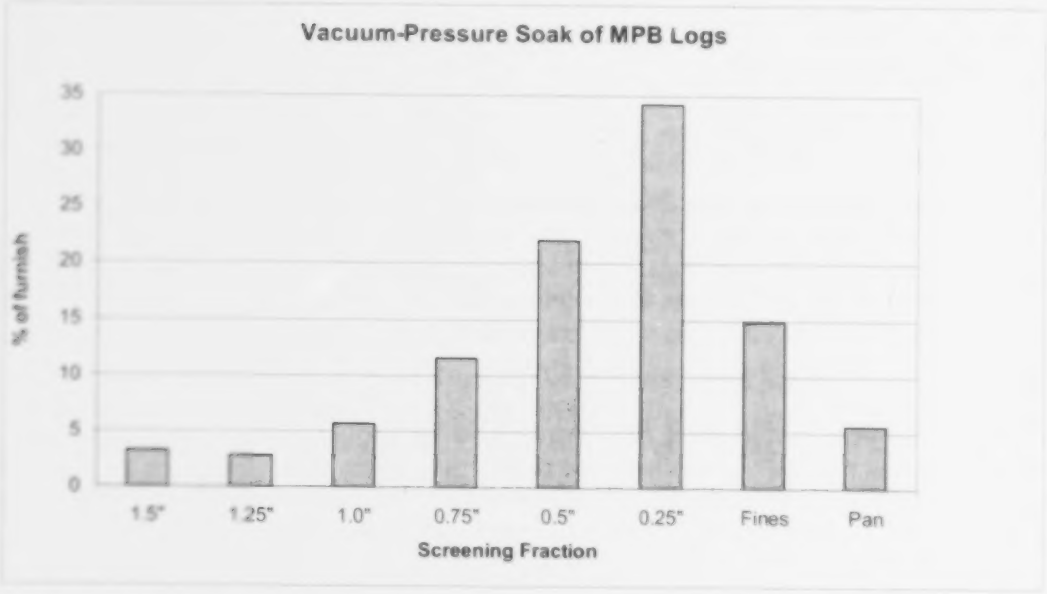

Figure 32 Strand Size Distribution of Vacuum-Pressure Treated MPB Logs

Results from the conditioning studies pointed out the time-dependent nature of adding moisture to the MPB wood. Conventional water soak conditioning as practised in all Canadian OSB mills is clearly insufficient to introduce moisture, except to the extreme outer regions of the MPB logs. Vacuum-pressure treatment rapidly added large amounts of moisture to the extremely permeable blue-stained sapwood, but added little moisture to the difficult-to-penetrate heartwood. The slower moisture uptake from log sprinkling allowed time for a limited, but apparently important, amount of moisture uptake throughout the logs resulting in reduced fines and an increase in the amount of larger strands. In sprinkling, the amount of moisture increase in the heartwood was small because of the low permeability of the heartwood. However, the normal heartwood moisture content of fresh lodgepole pine heartwood is low at 41% (US Wood Products Laboratory 1999), so high moisture content is probably not necessary for the heartwood of MPB wood to strand similarly to heartwood from fresh, healthy lodgepole pine. Study results suggested that heartwood moisture content near the fibre saturation point was sufficient to reduce fines and increase the amount of large strands.

4 Conclusions

The grey stage MPB logs used in this study had little bark, were heavily checked and had relatively even moisture gradients. Their moisture averaged 15% to 25%, about one-half that of the green pine logs and one-third that of green aspen. Their average dry density was about the same as that of green pine but about 23% higher than the dry density of aspen.

Vat conditioning is only effective for increasing moisture in the extreme outer portions of the logs. After water vat conditioning at 15°C for six hours, the moisture content of the MPB logs used in the strander tests increased to an average of 31.4% from 23.8%. The moisture content of the outer 1-inch section of the MPB logs was raised to 35.0% while the moisture content of the inner sections remained at 20.7%.

Strander knife package set-up can have a significant impact on the outcome of strand size distribution as in the case of modified 70° counter-knife angle, where significantly more fines and fewer large size strands were generated. However, the differences between the outcomes of 50°, 60° and 70° counter-knife angles were small. The lack of significant differences among the three counter-knife angles was unexpected as previous experience with other wood types had shown strand width to increase as the counter-knife angle decreased. It remains to be seen whether the results observed in this study are representative of MPB wood or a characteristic of this particular wood sample.

The moisture content of the MPB logs increased after sprinkling and vat conditioning. Vat conditioning alone without sprinkling raised the average moisture content from 19.5% to 30.8%. After 10 days sprinkling, moisture content increased to 48.9%; after 20 days sprinkling, moisture content increased to 59.3%; and after 30 days sprinkling, moisture content increased to 61.2%. Almost three-quarters of the moisture gain was already achieved after 10 days sprinkling; 95% of the moisture gain was achieved after 20 days sprinkling; and not much more was achieved with the additional 10 days sprinkling (30 days).

Similar to vat conditioning, water sprinkling is effective in increasing moisture content in only the outer sections of the logs.

Water sprinkling was an effective method for reducing the production of fines and increasing the proportion of larger strands from MPB logs. The generation of fines during stranding of the MPB logs was reduced by 28% after 10 days sprinkling, by 30% after 20 days sprinkling and by 35% after 30 days sprinkling. Water sprinkling increased the percentage of larger strands (1.5" to 0.75" screen sizes). With most of the benefits already realized after 10 days sprinkling, extending sprinkling time beyond 10 days produced only a small gain. Water sprinkling for 30 days reduced fines to a level similar to that of green pine but it still produced fewer large strands than green pine.

Green aspen produced the smallest amount of fines and the largest amount of large strands.

5 Recommendations

There is good potential for improvement in the area of log conditioning to increase moisture uptake in the inner portions of MPB wood. Further development of industrially viable methods to increase the moisture content of MPB wood is strongly recommended. Such work should address both industrial scale-up of sprinkled log storage, and changes to log pond operation as means to increase MPB wood moisture content.

6 Acknowledgements

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7 Literature Cited

Knudson, R.M. and Chen, L. 2001. Effect of aspen log moisture content on stranding, strand quality and properties of OSB. Forintek Canada Corp. Report, Contract No. 2001-2322.

Macey, T. 2004. Personal communication to Bob Knudson.

Maloney, T.M.; Talbott, J.W.; Strickler. J.W.; Lenz, M.D. and Martin, T. 1976. Composition board from standing dead white pine and dead lodgepole pine. *In:* Proceeding of the 10th international particleboard symposium; 1976 March; Pullman, WA: Washington State University, Extension Service 27-104.

Maloney, T.M. 1981. Comparative economics of manufacturing composition boards from dead timber. Forest Products Journal 31(5). 28-36.

McDonald, R. 2004. Personal communication to Bob Knudson.

US Forest Products Laboratory. Rev. 1999. Wood Handbook: Wood as an Engineering Material. p. 14-16.

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Appendix I

Data from Strander Set-up Tests

MPB Log diameters, moisture and densities before strander set-up tests

LOG#	Wet Wt (gms)	VOLUME (cm^3)	BUTT DIAMETER (in)	TIP DIAMETER (in)	AVERAGE DIAMETER (in)	DENSITY (gm/cm^3)	DENSITY (lbs/cu.ft)	Dry Wt. (gm)	MC% Dry Base	Specific Gravity
1	4665	9260	11.00	10.75	10.88	0.504	31.44	3820	22.1	0.413
2	3615	7365	10.00	9.75	9.88	0.491	30.63	3005	20.3	0.408
3	3875	7985	10.75	10.25	10.50	0.485	30.28	3230	20.0	0.405
4	4420	8825	11.50	10.75	11.13	0.501	31.25	3665	20.6	0.415
5	3320	6750	9.75	9.25	9.50	0.492	30.69	2685	23.6	0.398
6	4400	7410	11.00	9.50	10.25	0.594	37.05	3520	25.0	0.475
7	3760	6235	9.75	9.00	9.38	0.603	37.63	3015	24.7	0.484
8	2490	4332	7.75	7.50	7.63	0.575	35.87	1945	28.0	0.449
9	3200	6435	9.75	9.38	9.56	0.497	31.03	2675	19.6	0.416
10	3620	6780	9.88	9.25	9.56	0.534	33.32	2985	21.3	0.440
11	4155	7295	12.00	10.00	11.00	0.570	35.54	3395	22.4	0.465
12	3575	5860	9.25	9.00	9.13	0.610	38.07	2855	25.2	0.487
13	3715	7345	10.50	9.75	10.13	0.506	31.56	3000	23.8	0.408
14	4420	7455	10.75	10.00	10.38	0.593	37.00	3540	24.9	0.475
15	3175	6200	10.00	9.50	9.75	0.512	31.95	2555	24.3	0.412
16	4965	8625	11.50	10.50	11.00	0.576	35.92	4080	21.7	0.473
17	3690	6640	10.75	9.50	10.13	0.556	34.68	2810	31.3	0.423
18	4155	7245	11.00	10.00	10.50	0.573	35.79	3175	30.9	0.438
19	2600	5400	9.50	8.00	8.75	0.481	30.04	2075	25.3	0.384
20	4085	8090	11.25	10.50	10.88	0.505	31.51	3365	21.4	0.416
					9.99	0.538	33.56	3070	23.8	0.434

Log diameters, moisture and densities after strander set-up tests

Set 1 for 50 degree strander counter knife set-up

SAMPLE#	Wet Wt (gms)	VOLUME (cm^3)	INITIAL DIAMETER (in)	INITIAL DIAMETER (in)	AVERAGE DIAMETER (in)	DENSITY (gm/cm^3)	DENSITY (lbs/cu.ft)	Dry Wt. (gm)	MC% Dry Base	Specific Gravity	
1-1	866.90	1560	11.00	10.75	10.88	0.556	34.68	591.21	46.6	0.379	decay
2-2	663.25	1250	10.00	9.75	9.88	0.531	33.11	507.86	30.6	0.406	
3-3	789.74	1525	10.75	10.25	10.50	0.518	32.31	598.65	31.9	0.393	
4-4	799.72	1465	11.50	10.75	11.13	0.546	34.06	616.61	29.7	0.421	
5-1	641.41	1135	9.75	9.25	9.50	0.565	35.26	448.02	43.2	0.395	decay
6-2	810.10	1300	11.00	9.50	10.25	0.623	38.88	586.85	38.0	0.451	
7-3	652.77	1120	9.75	9.00	9.38	0.583	36.37	500.46	30.4	0.447	
8-4	406.09	698	7.75	7.50	7.63	0.582	36.30	310.88	30.6	0.445	
9-1	442.45	925	9.75	9.38	9.56	0.478	29.85	344.36	28.5	0.372	
10-2	651.83	1190	9.88	9.25	9.56	0.548	34.18	532.46	22.4	0.447	
11-3	703.69	1195	12.00	10.00	11.00	0.589	36.74	526.37	33.7	0.440	
12-4	597.71	1015	9.25	9.00	9.13	0.589	36.75	459.07	30.2	0.452	
13-1	665.66	1250	10.50	9.75	10.13	0.533	33.23	503.92	32.1	0.403	
14-2	809.25	1350	10.75	10.00	10.38	0.599	37.41	637.54	26.9	0.472	
15-3	559.56	1080	10.00	9.50	9.75	0.518	32.33	437.95	27.8	0.406	
16-4	866.55	1450	11.50	10.50	11.00	0.598	37.29	675.44	28.3	0.466	
17-1	775.73	1315	10.75	9.50	10.13	0.590	36.81	500.72	54.9	0.381	
18-2	784.06	1320	11.00	10.00	10.50	0.594	37.06	568.88	37.8	0.431	
19-3	612.78	1180	9.50	8.00	8.75	0.519	32.40	473.09	29.5	0.401	
20-4	721.33	1350	11.25	10.50	10.88	0.534	33.34	567.39	27.1	0.420	
Average					***9.99***	***0.560***	***34.92***	***519.39***	***33.0***	***0.421***	
St. Dev.					***0.88***	***0.037***	***2.32***	***92.17***	***7.7***	***0.030***	

Set 2 for 60 degree strander counter knife set-up

SAMPLE#	Wet Wt (gms)	VOLUME (cm^3)	INITIAL DIAMETER (in)	INITIAL DIAMETER (in)	AVERAGE DIAMETER (in)	DENSITY (gm/cm^3)	DENSITY (lbs/cu.ft)	Dry Wt. (gm)	MC% Dry Base	Specific Gravity
1-2	831.46	1445	11.00	10.75	10.88	0.575	35.91	600.54	38.5	0.416
2-3	652.46	1260	10.00	9.75	9.88	0.518	32.31	504.09	29.4	0.400
3-4	684.30	1255	10.75	10.25	10.50	0.545	34.02	511.50	33.8	0.408
4-1	728.34	1280	11.50	10.75	11.13	0.569	35.51	547.57	33.0	0.428
5-2	640.42	1135	9.75	9.25	9.50	0.564	35.21	436.30	46.8	0.384
6-3	761.09	1205	11.00	9.50	10.25	0.632	39.41	558.66	36.2	0.464
7-4	616.34	1030	9.75	9.00	9.38	0.598	37.34	476.88	29.2	0.463
8-1	444.20	735	7.75	7.50	7.63	0.604	37.71	331.19	34.1	0.451
9-2	555.92	1100	9.75	9.38	9.56	0.505	31.54	427.78	30.0	0.389
10-3	606.05	1115	9.88	9.25	9.56	0.544	33.92	458.25	32.3	0.411
11-4	670.03	1140	12.00	10.00	11.00	0.588	36.68	508.78	31.7	0.446
12-1	642.02	1050	9.25	9.00	9.13	0.611	38.15	502.81	27.7	0.479
13-2	676.09	1270	10.50	9.75	10.13	0.532	33.22	503.95	34.2	0.397
14-3	762.56	1280	10.75	10.00	10.38	0.596	37.17	594.83	28.2	0.465
15-4	510.30	1005	10.00	9.50	9.75	0.508	31.68	403.07	26.6	0.401
16-1	883.24	1525	11.50	10.50	11.00	0.579	36.14	693.03	27.4	0.454
17-2	670.32	1115	10.75	9.50	10.13	0.601	37.51	494.62	35.5	0.444
18-3	715.96	1195	11.00	10.00	10.50	0.599	37.39	519.28	37.9	0.435
19-4	477.84	910	9.50	8.00	8.75	0.525	32.77	380.63	25.5	0.418
20-1	882.61	1605	11.25	10.50	10.88	0.550	34.31	707.08	24.8	0.441
Average					***9.99***	***0.567***	***35.40***	***508.04***	***32.1***	***0.430***
St. Dev.					***0.88***	***0.037***	***2.32***	***94.03***	***5.3***	***0.028***

Log diameters, moisture and densities after strander set-up tests

Set 3 for 70 degree strander counter knife set-up

SAMPLE#	Wet Wt (gms)	VOLUME (cm^3)	INITIAL DIAMETER (in)	INITIAL DIAMETER (in)	AVERAGE DIAMETER (in)	DENSITY (gm/cm^3)	DENSITY (lbs/cu.ft)	Dry Wt. (gm)	MC% Dry Base	Specific Gravity
1-3	937.87	1465	11.00	10.75	10.88	0.640	39.95	694.66	35.0	0.474
2-4	574.65	1140	10.00	9.75	9.88	0.504	31.45	460.97	24.7	0.404
3-1	685.09	1265	10.75	10.25	10.50	0.542	33.79	526.94	30.0	0.417
4-2	736.78	1460	11.50	10.75	11.13	0.505	31.49	569.64	29.3	0.390
5-3	580.27	1070	9.75	9.25	9.50	0.542	33.84	438.00	32.5	0.409
6-4	762.29	1145	11.00	9.50	10.25	0.666	41.54	569.94	33.7	0.498
7-1	657.18	1055	9.75	9.00	9.38	0.623	38.87	500.21	31.4	0.474
8-2	370.41	625	7.75	7.50	7.63	0.593	36.98	286.33	29.4	0.458
9-3	524.97	1020	9.75	9.38	9.56	0.515	32.12	403.29	30.2	0.395
10-4	525.02	990	9.88	9.25	9.56	0.530	33.09	418.87	25.3	0.423
11-1	679.13	1120	12.00	10.00	11.00	0.606	37.84	510.71	33.0	0.456
12-2	659.15	990	9.25	9.00	9.13	0.666	41.55	512.72	28.6	0.518
13-3	639.28	1120	10.50	9.75	10.13	0.571	35.62	468.34	36.5	0.418
14-4	675.32	1125	10.75	10.00	10.38	0.600	37.46	544.86	23.9	0.484
15-1	539.12	1075	10.00	9.50	9.75	0.502	31.29	426.52	26.4	0.397
16-2	820.02	1390	11.50	10.50	11.00	0.590	36.81	659.07	24.4	0.474
17-3	628.31	1050	10.75	9.50	10.13	0.598	37.34	436.51	43.9	0.416
18-4	665.80	1070	11.00	10.00	10.50	0.622	38.83	465.13	43.1	0.435
19-1	427.50	860	9.50	8.00	8.75	0.497	31.02	333.43	28.2	0.388
20-2	714.33	1350	11.25	10.50	10.88	0.529	33.02	570.67	25.2	0.423
Average					***9.99***	***0.572***	***35.69***	***489.84***	***30.7***	***0.438***
St. Dev.					***0.88***	***0.056***	***3.48***	***98.74***	***5.7***	***0.039***

Set 4 for 70 degree modified strander counter knife set-up

SAMPLE#	Wet Wt (gms)	VOLUME (cm^3)	INITIAL DIAMETER (in)	INITIAL DIAMETER (in)	AVERAGE DIAMETER (in)	DENSITY (gm/cm^3)	DENSITY (lbs/cu.ft)	Dry Wt. (gm)	MC% Dry Base	Specific Gravity
1-4	905.47	1565	11.00	10.75	10.88	0.579	36.10	682.68	32.6	0.436
2-1	671.45	1285	10.00	9.75	9.88	0.523	32.61	542.95	23.7	0.423
3-2	800.43	1450	10.75	10.25	10.50	0.552	34.45	615.73	30.0	0.425
4-3	854.04	1520	11.50	10.75	11.13	0.562	35.06	670.37	27.4	0.441
5-4	597.86	1095	9.75	9.25	9.50	0.546	34.07	435.87	37.2	0.398
6-1	874.89	1450	11.00	9.50	10.25	0.603	37.65	673.17	30.0	0.464
7-2	704.56	1130	9.75	9.00	9.38	0.624	38.91	530.92	32.7	0.470
8-3	432.57	735	7.75	7.50	7.63	0.589	36.72	336.53	28.5	0.458
9-4	580.01	1090	9.75	9.38	9.56	0.532	33.20	441.48	31.4	0.405
10-1	675.35	1270	9.88	9.25	9.56	0.532	33.18	553.99	21.9	0.436
11-2	850.48	1400	12.00	10.00	11.00	0.607	37.91	652.25	30.4	0.466
12-3	620.92	1025	9.25	9.00	9.13	0.606	37.80	485.18	28.0	0.473
13-4	662.27	1195	10.50	9.75	10.13	0.554	34.58	480.09	37.9	0.402
14-3	855.99	1385	10.75	10.00	10.38	0.618	38.57	684.92	25.0	0.495
15-2	620.76	1210	10.00	9.50	9.75	0.513	32.01	493.26	25.8	0.408
16-3	889.28	1465	11.50	10.50	11.00	0.607	37.88	701.65	26.7	0.479
17-4	716.49	1180	10.75	9.50	10.13	0.607	37.89	507.14	41.3	0.430
18-1	855.91	1440	11.00	10.00	10.50	0.594	37.09	648.47	32.0	0.450
19-2	450.96	890	9.50	8.00	8.75	0.507	31.62	350.55	28.6	0.394
20-3	792.57	1410	11.25	10.50	10.88	0.562	35.08	627.67	26.3	0.445
Average					***9.99***	***0.571***	***35.62***	***555.74***	***29.9***	***0.440***
St. Dev.					***0.88***	***0.037***	***2.33***	***113.10***	***4.9***	***0.029***

Moisture Gradient

Beetle Killed Logs
Measured initially after cutting

	Green wt	Dry Wt	%MC	
1-1	44.56	36.05	23.6	
1-2	44.43	35.2	26.2	
1-3	52.36	41.44	26.4	
1-4	49.93	39.18	27.4	
1-5	48.82	38.02	28.4	
1-6	46.83	37.14	26.1	
1-7	49.99	40.46	23.6	
1-8	56.55	46.6	21.4	
1-9	63.07	52.63	19.8	
2-1	32.07	27.11	18.3	
2-2	32.62	27.18	20.0	
2-3	32.67	26.98	21.1	
2-4	37.22	30.74	21.1	
2-5	34.72	28.4	22.3	
2-6	31.41	25.98	20.9	
2-7	30.49	25.41	20.0	
2-8	40.94	34.54	18.5	
3-1	38.57	30.59	26.1	
3-2	43.09	35.72	20.6	
3-3	39.48	33.46	18.0	
3-4	39.77	33.41	19.0	
3-5	40.64	34.45	18.0	
3-6	42.48	35.66	19.1	
3-7	28.77	23.92	20.3	
4-1	40.25	33.9	18.7	
4-2	46.07	39.03	18.0	
4-3	43.08	35.96	19.8	
4-4	39.78	32.24	23.4	
4-5	42.34	33.3	27.1	
4-6	46.21	38.21	20.9	
4-7	47.91	40.35	18.7	
4-8	39.25	33.26	18.0	
4-9	31.42	26.59	18.2	
5-1	39.26	32.34	21.4	
5-2	46.56	39.1	19.1	
5-3	49.39	41.48	19.1	
5-4	52.39	42.65	22.8	
5-5	47.37	38.72	22.3	
5-6	37.33	30.31	23.2	
5-7	43.69	35.55	22.9	
6-1	60.09	39.8	51.0	decay
6-2	56.16	45.58	23.2	
6-3	55.00	45.25	21.5	
6-4	50.41	41.89	20.3	
6-5	48.18	40.03	20.4	
6-6	49.61	39.92	24.3	
6-7	52.85	40.79	29.6	
7-1	29.06	23.87	21.7	
7-2	29.89	25.22	18.5	
7-3	29.5	24.89	18.5	
7-4	26.79	22.43	19.4	
7-5	27.45	22.71	20.9	
7-6	29.6	24.82	19.3	
7-7	32.1	26.85	19.6	
7-8	30.83	25.19	22.4	
7-9	17.18	14.16	21.3	

	Green wt	Dry Wt	%MC	
8-1	44.27	35.56	24.5	
8-2	47.43	38.05	24.7	
8-3	44.86	35.74	25.5	
8-4	44.83	35.52	26.2	
8-5	44.41	35.67	24.5	
8-6	26.63	21.43	24.3	
8-7	35.17	28.52	23.3	
9-1	40.78	34.38	18.6	
9-2	43.42	36.63	18.5	
9-3	40.94	34.53	18.6	
9-4	46.6	39.21	18.8	
9-5	38.58	32.32	19.4	
9-6	39.79	32.92	20.9	
9-7	46.41	38.22	21.4	
10-1	40.64	32.76	24.1	
10-2	42.84	36.31	18.0	
10-3	44.2	37.75	17.1	
10-4	42.82	36.35	17.8	
10-5	41.88	35.78	17.0	
10-6	44.18	36.68	20.4	
11-1	40.56	33.68	20.4	
11-2	46.24	38.8	19.2	
11-3	48.1	40.09	20.0	
11-4	45.6	37.6	21.3	
11-5	47.5	39.15	21.3	
11-6	51.31	42.52	20.7	
11-7	60.43	50.03	20.8	
11-8	39.28	31.69	24.0	decay
11-9	42.47	34.41	23.4	decay
12-1	38.01	31.3	21.4	
12-2	27.97	21.7	28.9	
12-3	32.25	26.3	22.6	
12-4	27.71	22.46	23.4	
12-5	28.15	22.65	24.3	
12-6	28.18	22.56	24.9	
12-7	26.62	21.37	24.6	
12-8	29.86	24.1	23.9	
12-9	31.96	25.62	24.7	
12-10	30.50	21.26	43.5	
13-1	38.63	30.35	27.3	
13-2	40.41	33.9	19.2	
13-3	40.24	33.88	18.8	
13-4	38.37	31.77	20.8	
13-5	37.75	31.58	19.5	
13-6	35.49	29.58	20.0	
13-7	13.75	11.48	19.8	
13-8	29.41	24.33	20.9	

	Green wt	Dry Wt	%MC	
14-1	32.38	25.71	25.9	
14-2	30.82	25.85	19.2	
14-3	26.34	22.1	19.2	
14-4	29.17	24.49	19.1	
14-5	22.13	18.64	18.7	
14-6	25.94	21.81	18.9	
14-7	18.8	15.71	19.7	
14-8	25.93	21.21	22.3	
14-9	31.43	21.31	47.5	pitch
15-1	33.64	27.54	22.1	
15-2	32.98	27.56	19.7	
15-3	29.68	24.52	21.0	
15-4	31.72	25.87	22.6	
15-5	30.76	25.17	22.2	
15-6	26.06	21.22	22.8	
15-7	25.91	20.52	26.3	
16-1	37.66	31	21.5	
16-2	41.93	35.63	17.7	
16-3	42.15	35.91	17.4	
16-4	40.81	34.79	17.3	
16-5	35.17	29.43	19.5	
16-6	36.02	30.74	17.2	
16-7	37.00	31.61	17.1	
16-8	36.91	31.56	17.0	
16-9	39.15	32.26	21.4	
17-1	30.79	25.7	19.8	
17-2	35.83	29.48	21.5	
17-3	36.76	30.39	21.0	
17-4	31.37	25.5	23.0	
17-5	31.54	25.85	22.0	
17-6	34.68	28.24	22.8	
17-7	22.04	17.39	26.7	
17-8	23.68	15.84	49.5	
17-9	33.57	21.42	56.7	
18-1	47.33	31.37	50.9	decay
18-2	43.51	34.26	27.0	
18-3	42.44	34.44	23.2	
18-4	43.94	36.18	21.4	
18-5	46.35	38.82	19.4	
18-6	43.09	36.38	18.4	
18-7	30.15	25.61	17.7	
18-8	37.27	31.47	18.4	
18-9	45.02	36.43	23.6	
19-1	20.8	17.32	20.1	
19-2	20.81	17.73	17.4	
19-3	23.51	20.31	15.8	
19-4	23.46	20.25	15.9	
19-5	25.76	21.86	17.8	
19-6	24.51	20.97	16.9	
19-7	25.4	21.69	17.1	
19-8	16.36	13.87	18.0	
19-9	37.05	28.52	29.9	
20-1	25.89	21.93	18.1	
20-2	29.53	25.21	17.1	
20-3	27.78	23.97	15.9	
20-4	26.48	22.89	15.7	
20-5	26.36	22.92	15.0	
20-6	27.35	23.7	15.4	
20-7	23.85	20.57	15.9	
20-8	25.79	22.25	15.9	
20-9	24.52	21.13	16.0	
20-10	29.33	24.95	17.6	
20-11	15.70	13.39	17.3	

Moisture Gradient for set #1

MPB log samples after stranding

Set 1	50 deg knife		22-Apr	
Log#	Green wt	Dry Wt	%MC	
1-1				
1-1	26.40	16.65	58.56	decay
1-2	19.09	15.44	23.64	
1-3	16.63	13.43	23.83	
1-4	15.54	12.44	24.92	
1-5	16.60	12.93	28.38	
1-6	16.10	12.57	28.08	
1-7	17.42	13.63	27.81	
1-8	18.54	14.24	30.20	
1-9	12.71	6.64	91.42	decay
2-2				
2-1	10.08	8.16	23.53	
2-2	18.81	15.58	20.73	
2-3	16.90	14.02	20.54	
2-4	16.31	13.54	20.46	
2-5	16.18	13.26	22.02	
2-6	17.03	13.71	24.22	
2-7	17.10	13.88	23.20	
2-8	18.85	15.50	21.61	
2-9	19.71	16.20	21.67	
3-3				
3-1	33.68	23.44	43.69	decay
3-2	16.73	14.10	18.65	
3-3	17.26	14.66	17.74	
3-4	15.92	13.53	17.66	
3-5	15.94	13.29	19.94	
3-6	15.84	13.37	18.47	
3-7	16.78	14.09	19.09	
3-8	18.22	14.53	25.40	
3-9	17.22	12.54	37.32	decay
4-4				
4-1	24.47	19.43	25.94	
4-2	17.09	14.09	21.29	
4-3	16.75	13.66	22.62	
4-4	16.73	13.43	24.57	
4-5	17.79	14.42	23.37	
4-6	15.87	13.24	19.86	
4-7	16.25	13.78	17.92	
4-8	16.25	13.81	17.67	
4-9	17.60	14.40	22.22	
5-1				
5-1	19.77	12.50	58.16	decay
5-2	18.21	14.83	22.79	
5-3	17.17	14.30	20.07	
5-4	17.43	14.44	20.71	
5-5	15.97	13.16	21.35	
5-6	17.82	15.02	18.64	
5-7	17.93	15.06	19.06	
5-8	18.32	13.91	31.70	decay
5-9	7.76	4.59	69.06	decay
6-2				
6-1	22.73	15.36	47.98	decay
6-2	21.62	16.58	30.40	
6-3	19.77	16.37	20.77	
6-4	19.65	16.39	19.89	
6-5	19.25	16.11	19.49	
6-6	18.91	15.38	22.95	
6-7	20.73	16.94	22.37	
6-7	21.02	16.61	26.55	
6-8	20.08	14.96	34.22	decay
7-3				
7-1	19.59	16.24	20.63	
7-2	21.04	17.86	17.81	
7-3	19.00	16.07	18.23	
7-4	18.91	15.50	22.00	check
7-5	19.06	15.94	19.57	
7-6	20.56	17.25	19.19	
7-7	20.18	16.63	21.35	
7-8	21.25	15.08	40.92	decay

Log#	Green wt	Dry Wt	%MC	
8-4				
8-1	26.22	21.49	22.01	
8-2	17.73	14.49	22.36	
8-3	18.81	15.15	24.16	
8-4	20.18	16.20	24.57	
8-5	21.22	16.92	25.41	
8-6	21.36	15.47	38.07	
9-1				
9-1	19.66	16.03	22.65	
9-2	17.04	14.53	17.27	
9-3	15.47	13.11	18.00	
9-4	16.09	13.51	19.10	
9-5	17.15	14.27	20.18	
9-6	16.60	14.03	18.32	
9-7	16.89	14.38	17.45	
9-8	16.71	14.07	18.76	
10-2				
10-1	30.19	24.90	21.24	
10-2	17.80	15.29	16.42	
10-3	16.05	13.76	16.64	
10-4	18.84	15.92	18.34	
10-5	20.21	17.49	15.55	
10-6	17.97	15.43	16.46	
10-6	18.19	15.42	17.96	
10-7	18.16	14.75	23.12	
11-3				
11-1	26.55	18.59	42.82	decay
11-2	20.80	17.32	20.09	
11-3	19.83	16.48	20.33	
11-4	17.95	14.83	21.04	
11-5	18.17	14.96	21.46	
11-6	18.76	15.51	20.95	
11-7	19.25	15.99	20.39	
11-8	19.63	15.91	23.38	
11-9	21.93	14.23	54.11	decay
12-4				
12-1	17.02	13.01	30.82	
12-2	22.68	18.70	21.28	
12-3	21.79	17.78	22.55	
12-4	18.74	15.16	23.61	
12-5	19.12	15.22	25.62	
12-6	18.80	15.07	24.75	
12-7	22.06	17.84	23.65	
12-8	22.03	17.43	26.39	
13-1				
13-1	14.41	8.51	69.33	decay
13-2	20.14	14.78	36.27	decay
13-3	17.74	14.98	18.42	
13-4	18.73	15.82	18.39	
13-5	16.39	13.70	19.64	
13-6	16.17	13.54	19.42	
13-7	17.49	14.85	17.78	
13-8	16.72	14.04	19.09	
13-9	15.15	12.09	25.31	
14-2				
14-1	16.11	13.18	22.23	
14-2	23.08	19.58	17.88	
14-3	22.15	18.81	17.76	
14-4	19.30	16.43	17.47	
14-5	19.46	15.62	24.58	
14-6	18.61	15.76	18.08	
14-7	21.00	17.77	18.18	
14-8	21.48	17.91	19.93	
14-9	17.35	13.86	25.18	

Log#	Green wt	Dry Wt	%MC	
15-3				
15-1	7.50	5.90	27.12	
15-2	17.99	15.06	19.46	
15-3	16.56	13.78	20.17	
15-4	17.68	14.69	20.35	
15-5	20.79	17.08	21.72	
15-6	18.50	15.40	20.13	
15-7	17.41	14.51	19.99	
15-8	17.99	15.06	19.46	
15-9	17.39	14.24	22.12	
16-4				
16-1	37.23	30.26	23.03	
16-2	20.88	17.76	17.57	
16-3	21.77	18.54	17.42	
16-4	19.18	16.25	18.03	
16-5	20.19	16.85	19.82	
16-6	21.23	18.17	16.84	
16-7	20.90	17.91	16.69	
16-8	20.87	17.42	19.80	
16-9	20.78	15.34	35.46	
17-1				
17-1	22.18	11.07	100.36	decay
17-2	19.21	13.89	38.30	
17-3	18.62	14.57	27.80	
17-4	18.60	14.63	27.14	
17-5	17.03	13.67	24.58	
17-6	17.69	14.38	23.02	
17-7	19.29	15.76	22.40	
17-8	18.43	14.99	22.95	
17-9	19.14	14.74	29.85	
18-2				
18-1	24.82	20.54	20.84	
18-2	20.84	17.74	17.47	
18-3	20.56	17.46	17.75	
18-4	19.30	16.29	18.48	
18-5	20.17	16.87	19.56	
18-6	19.38	15.95	21.50	
18-7	19.10	15.63	22.20	
18-8	19.51	15.37	26.94	
18-9	21.84	13.57	60.94	decay
19-3				
19-1	13.99	11.70	19.57	
19-2	16.58	14.11	17.51	
19-3	16.57	14.22	16.53	
19-4	15.98	13.51	18.28	
19-5	15.85	13.66	16.03	
19-6	17.63	15.17	16.22	
19-7	20.94	17.35	20.69	
19-8				
20-4				
20-1	20.73	16.80	23.39	
20-2	18.43	15.62	17.99	
20-3	16.66	14.35	16.10	
20-4	16.27	14.05	15.80	
20-5	16.22	13.54	19.79	
20-6	16.01	13.77	16.27	
20-7	17.73	15.30	15.88	
20-8	19.06	15.76	20.94	
20-9	16.71	12.71	31.47	

Moisture Gradient for set #2

MPB log samples after stranding

Set 2	60 deg knife		23-Apr	
Log#	Green wt	Dry Wt	%MC	
1-2				
1-1	17.99	12.76	40.99	
1-2	17.31	14.16	22.25	
1-3	17.55	14.51	20.95	
1-4	16.27	13.37	21.69	
1-5	16.12	13.06	23.43	
1-6	16.28	12.96	25.62	
1-7	17.05	13.58	25.55	
1-8	18.15	14.35	26.48	
1-9	19.42	13.12	48.02	decay
1-10	16.31	8.64	88.77	decay
2-3				
2-1	18.37	14.87	23.54	
2-2	18.16	15.23	19.24	
2-3	15.78	13.15	20.00	
2-4	14.90	12.39	20.26	
2-5	16.58	13.43	23.45	
2-6	15.11	12.43	21.56	
2-7	15.88	13.24	19.94	
2-8	17.80	14.84	19.95	
2-9	22.17	18.08	22.62	
3-4				
3-1	20.09	13.98	43.71	
3-2	19.65	15.09	30.22	
3-3	17.14	14.51	18.13	
3-4	17.31	14.21	21.82	
3-5	15.89	13.19	20.47	
3-6	16.51	14.01	17.84	
3-7	16.91	14.43	17.19	
3-8	18.65	15.36	21.42	
3-9	18.01	14.16	27.19	
4-1				
4-1	17.61	13.21	33.31	
4-2	16.32	12.89	26.61	
4-3	18.56	15.39	20.60	
4-4	18.33	15.31	19.73	
4-5	17.28	14.27	21.09	
4-6	18.10	14.97	20.91	
4-7	20.36	16.90	20.47	
4-8	28.67	21.16	35.49	
5-2				
5-1	16.89	12.31	37.21	
5-2	17.40	14.32	21.51	
5-3	16.01	13.53	18.33	
5-4	15.78	13.25	19.09	
5-5	16.52	13.34	23.84	
5-6	17.02	13.85	22.89	
5-7	18.57	15.10	22.98	
5-8	22.23	15.04	47.81	
5-9	9.70	5.87	65.25	
6-3				
6-1	22.31	15.85	40.76	decay
6-2	21.96	18.01	21.93	
6-3	20.78	17.55	18.40	
6-4	19.73	16.50	19.58	
6-5	18.74	15.38	21.85	
6-6	21.41	17.65	21.30	
6-7	22.32	17.92	24.55	
6-8	13.18	8.35	57.84	
6-9	25.46	16.12	57.94	
7-4				
7-1	20.70	15.93	29.94	
7-2	21.11	17.76	18.86	
7-3	19.63	16.78	16.98	
7-4	22.19	18.93	17.22	
7-5	23.96	20.34	17.80	
7-6	22.54	19.21	17.33	
7-7	22.59	19.25	17.35	
7-8	23.83	19.86	19.99	

Log#	Green wt	Dry Wt	%MC	
8-1				
8-1	17.01	13.89	22.46	
8-2	19.97	16.50	21.03	
8-3	19.58	16.05	21.99	
8-4	19.27	15.52	24.16	
8-5	18.49	14.67	26.04	
8-6	21.19	16.78	26.28	
8-7	18.48	13.71	34.79	
9-2				
9-1	20.39	15.41	32.32	
9-2	18.33	14.96	22.53	
9-3	16.67	14.06	18.56	
9-4	15.63	13.14	18.95	
9-5	17.73	14.95	18.60	
9-6	15.61	13.24	17.90	
9-7	16.50	13.95	18.28	
9-8	14.25	11.71	21.69	
10-3				
10-1	19.18	14.52	32.09	
10-2	19.06	16.03	18.90	
10-3	19.27	16.54	16.51	
10-4	20.01	17.05	17.36	
10-5	23.02	19.85	15.97	
10-6	18.14	15.60	16.28	
10-7	19.99	16.99	17.66	
10-8	24.37	18.50	31.73	
11-4				
11-1	21.42	15.02	42.61	
11-2	19.35	15.90	21.70	
11-3	18.60	15.43	20.54	
11-4	18.51	15.25	21.36	
11-5	18.32	14.96	22.46	
11-6	17.74	14.56	21.84	
11-7	18.46	15.22	21.29	
11-8	19.16	15.58	22.98	
11-9	20.25	15.63	29.56	
12-1				
12-1	22.11	18.05	22.49	
12-2	22.11	18.10	22.15	
12-3	18.64	15.43	22.10	
12-4	18.45	15.03	22.75	
12-5	18.48	14.99	23.28	
12-6	19.45	16.02	21.41	
12-7	21.91	18.11	20.98	
12-8	21.09	17.18	22.76	
13-2				
13-1	22.02	12.98	69.65	decay
13-2	20.48	15.40	32.99	decay
13-3	18.60	15.82	17.57	
13-4	19.06	16.15	18.02	
13-5	16.82	14.07	19.55	
13-6	17.44	14.84	17.52	
13-7	17.55	15.00	17.00	
13-8	16.87	13.93	21.11	
13-9	10.45	7.37	41.79	decay
14-3				
14-1	19.76	16.05	23.12	
14-2	21.77	18.42	18.19	
14-3	20.23	17.31	16.87	
14-4	18.47	15.70	17.64	
14-5	18.00	14.62	23.12	
14-6	18.43	15.73	17.16	
14-7	20.47	17.49	17.04	
14-8	21.58	18.21	18.51	
14-9	18.77	15.33	22.44	

Log#	Green wt	Dry Wt	%MC	
15-4				
15-1	14.34	11.54	24.26	
15-2	17.21	14.18	21.37	
15-3	16.63	13.82	20.33	
15-4	15.41	12.74	20.96	
15-5	17.10	14.01	22.06	
15-6	16.05	13.37	20.04	
15-7	17.48	14.58	19.89	
15-8	22.21	18.37	20.90	
16-1				
16-1	21.36	16.08	32.84	
16-2	23.35	19.64	18.89	
16-3	22.19	18.81	17.97	
16-4	22.36	18.88	18.43	
16-5	19.25	16.05	19.94	
16-6	18.75	15.75	19.05	
16-7	17.88	15.16	17.94	
16-8	18.79	15.86	18.47	
16-9	20.60	16.43	25.38	
16-10	13.19	9.68	36.26	decay
17-2				
17-1	19.11	12.32	55.11	decay
17-2	19.27	15.46	24.64	
17-3	18.30	15.07	21.43	
17-4	16.76	13.68	22.51	
17-5	17.26	14.07	22.67	
17-6	17.42	14.24	22.33	
17-7	18.70	15.08	24.01	
17-8	21.67	13.79	57.14	decay
17-9	16.18	9.71	66.63	decay
18-3				
18-1	16.93	12.89	31.34	decay
18-2	18.56	15.85	17.22	
18-3	19.27	16.34	17.93	
18-4	19.37	16.03	20.84	
18-5	20.71	17.23	20.20	
18-6	18.48	15.07	22.63	
18-7	18.63	14.88	25.20	
18-8	18.95	14.12	34.21	
18-9	8.94	5.15	73.59	decay
19-4				
19-1	26.90	22.47	19.72	
19-2	21.12	18.20	16.04	
19-3	18.76	16.12	16.38	
19-4	17.21	14.27	20.60	
19-5	17.18	14.83	15.85	
19-6	21.57	18.71	15.29	
19-7	23.46	19.57	19.88	
20-1				
20-1	17.44	14.64	19.13	
20-2	18.47	15.85	16.53	
20-3	16.19	14.09	14.90	
20-4	16.30	14.18	14.95	
20-5	17.58	15.16	15.96	
20-6	21.70	18.90	14.81	
20-7	17.15	14.81	15.80	
20-8	19.94	17.15	16.20	
20-9	18.00	15.22	18.27	
20-10	22.21	17.63	25.98	

Moisture Gradient for set #3

MPB log samples after standing

Set 3 Log#	70 deg knife Green wt	Dry Wt	29-Apr %MC
1-3			
1-1	18.69	12.07	54.85
1-2	16.85	13.46	25.19
1-3	16.87	13.35	26.37
1-4	15.72	12.47	26.06
1-5	15.87	12.65	25.45
1-6	17.25	14.07	22.60
1-7	17.43	15.55	12.09
1-8	17.34	14.41	20.33
1-9	17.35	14.37	20.74
1-10	17.32	10.27	68.65
2-4			
2-1	17.83	14.98	19.03
2-2	17.57	14.72	19.36
2-3	14.68	12.30	19.35
2-4	13.69	11.36	20.51
2-5	14.78	12.19	21.25
2-6	13.35	11.09	20.38
2-7	13.58	11.35	19.65
2-8	21.85	18.27	19.59
2-9	11.94	9.88	20.85
3-1			
3-1	19.53	13.55	47.08
3-2	16.29	13.66	19.25
3-3	15.91	13.56	17.33
3-4	20.58	17.72	16.14
3-5	18.17	15.50	17.23
3-6	17.68	15.21	16.24
3-7	16.21	13.88	16.79
3-8	17.69	14.95	18.33
3-9	17.19	14.29	20.29
4-2			
4-1	20.19	13.76	46.73
4-2	17.22	14.22	21.10
4-3	17.57	14.40	22.01
4-4	16.11	12.86	25.27
4-5	17.08	13.71	24.58
4-6	17.31	14.46	19.71
4-7	17.39	14.84	17.18
4-8	16.29	14.03	16.11
4-9	22.59	18.62	21.32
5-3			
5-1	25.91	17.69	46.47
5-2	17.83	14.77	20.72
5-3	16.21	13.59	19.28
5-4	15.49	12.95	19.61
5-5	15.60	13.09	19.17
5-6	15.97	13.50	18.30
5-7	16.74	14.00	19.57
5-8	17.18	12.65	35.81
6-4			
6-1	21.35	17.75	20.28
6-2	22.65	18.91	19.78
6-3	20.89	17.49	19.44
6-4	20.24	16.90	19.76
6-5	18.58	15.18	22.40
6-6	19.32	15.95	21.13
6-7	21.88	17.54	24.74
6-8	31.24	18.25	71.18
7-1			
7-1	20.14	16.07	25.33
7-2	20.14	16.83	19.67
7-3	19.45	16.41	18.53
7-4	18.31	15.22	20.30
7-5	17.96	15.00	19.73
7-6	19.52	16.70	19.28
7-7	20.18	16.62	21.42
7-8	31.94	22.72	40.58

Log#	Green wt	Dry Wt	%MC
8-2			
8-1	20.53	14.75	39.19
8-2	19.25	15.63	23.16
8-3	19.12	15.55	22.96
8-4	17.82	14.35	24.18
8-5	17.78	14.57	22.03
8-6	19.81	16.40	20.79
8-7	17.57	14.47	21.42
9-3			
9-1	16.70	12.24	36.44
9-2	16.19	13.39	20.91
9-3	14.43	12.11	19.16
9-4	15.58	13.07	19.20
9-5	15.24	12.86	18.51
9-6	15.10	12.84	17.60
9-7	15.51	13.21	17.41
9-8	17.62	13.70	28.61
10-4			
10-1	19.80	14.89	32.98
10-2	16.55	14.04	17.88
10-3	16.59	14.29	16.10
10-4	17.69	15.20	16.38
10-5	16.47	14.06	17.14
10-6	17.40	14.92	16.62
10-7	15.68	13.00	20.62
10-8	22.36	14.27	56.69
11-1			
11-1	10.90	8.46	28.84
11-2	15.10	12.47	21.09
11-3	18.02	14.70	22.59
11-4	18.75	15.23	23.11
11-5	19.13	15.54	23.10
11-6	19.45	15.93	22.10
11-7	18.40	15.15	21.45
11-8	17.94	14.55	23.30
11-9	9.20	7.59	21.21
11-10	18.46	13.90	32.81
12-2			
12-1	20.96	16.44	27.49
12-2	19.71	15.97	23.42
12-3	17.91	14.52	23.35
12-4	21.35	17.38	22.84
12-5	21.44	17.38	23.36
12-6	13.81	11.21	23.19
12-7	21.31	16.78	27.00
12-8	26.31	20.53	28.15
13-3			
13-1	16.76	10.59	58.26
13-2	17.42	13.94	24.96
13-3	17.15	14.23	20.52
13-4	15.78	12.80	23.28
13-5	16.72	13.97	19.69
13-6	16.75	14.15	18.37
13-7	16.86	14.29	17.98
13-8	9.57	8.16	17.28
13-9	14.32	11.87	20.64
14-4			
14-1	20.75	16.67	24.46
14-2	21.80	18.59	17.27
14-3	20.99	17.95	16.94
14-4	20.03	16.72	19.80
14-5	18.28	15.20	20.26
14-6	18.40	15.31	20.18
14-7	16.78	14.18	18.34
14-8	20.92	16.52	26.63
14-9	9.75	7.47	30.52

Log#	Green wt	Dry Wt	%MC
15-1			
15-1	14.23	11.64	22.25
15-2	15.28	12.87	18.73
15-3	14.67	12.17	20.54
15-4	14.04	11.41	23.05
15-5	15.52	12.76	21.63
15-6	14.23	11.87	19.86
15-7	15.32	12.89	18.85
15-8	21.86	18.46	18.42
16-2			
16-1	17.87	15.73	13.60
16-2	18.67	15.42	21.08
16-3	18.15	15.48	17.25
16-4	18.19	15.50	17.35
16-5	18.44	15.85	16.34
16-6	18.76	15.60	18.73
16-7	21.11	17.94	17.67
16-8	19.49	16.58	17.55
16-9	20.13	17.01	18.34
16-10	12.48	9.96	25.30
17-3			
17-1	22.65	13.73	64.97
17-2	18.94	14.92	26.94
17-3	17.42	14.10	23.55
17-4	17.08	13.86	23.09
17-5	16.00	13.18	21.40
17-6	18.33	15.22	20.43
17-7	19.06	15.42	23.61
17-8	21.56	14.52	48.48
18-4			
18-1	22.57	14.20	58.94
18-2	21.88	15.21	43.85
18-3	19.14	15.63	22.46
18-4	18.26	14.92	22.39
18-5	20.51	16.62	23.41
18-6	19.39	15.49	25.18
18-7	18.73	14.89	27.50
18-8	22.18	14.49	53.07
18-9	18.16	11.21	62.00
19-1			
19-1	18.42	13.54	36.04
19-2	16.14	13.49	19.64
19-3	17.52	15.02	16.64
19-4	16.13	13.27	21.55
19-5	15.86	13.53	17.22
19-6	15.41	13.27	16.13
19-7	8.89	7.58	17.28
19-8	12.79	10.61	20.55
20-2			
20-1	16.82	13.41	25.43
20-2	17.22	14.66	17.46
20-3	15.16	13.06	16.08
20-4	15.49	13.36	15.94
20-5	15.52	13.39	15.91
20-6	15.57	13.50	15.33
20-7	16.14	13.88	16.28
20-8	17.76	15.29	16.15
20-9	17.78	15.10	17.75
20-10	14.93	12.50	19.44

Moisture Gradient for set #4

MPB log samples after stranding

Set 4	75 deg knife (modified)		13-May	
Log#	Green wt	Dry Wt	%MC	
1-4				
1-1	20.73	14.14	46.61	decay
1-2	19.52	15.75	23.90	
1-3	19.32	14.87	29.93	
1-4	17.42	13.96	24.79	
1-5	16.53	13.60	34.78	
1-6	16.88	13.37	26.25	
1-7	19.37	15.74	23.08	
1-8	21.36	17.69	20.74	
1-9	23.44	19.07	22.92	
2-1				
2-1	12.67	10.87	16.52	
2-2	18.63	15.80	17.91	
2-3	17.24	14.56	18.41	
2-4	15.85	13.30	19.17	
2-5	19.31	16.21	19.08	
2-6	17.68	14.64	19.14	
2-7	15.57	13.08	19.04	
2-8	17.05	14.43	18.16	
2-9	16.81	13.90	20.90	
3-2				
3-1	22.09	14.83	48.95	decay
3-2	19.09	15.99	19.39	
3-3	17.93	15.15	18.35	
3-4	19.19	16.18	18.60	
3-5	20.12	17.17	17.18	
3-6	16.81	14.43	16.53	
3-7	18.42	15.89	15.92	
3-8	19.09	16.03	19.08	
3-9	14.55	12.01	21.15	
4-3				
4-1	10.94	8.65	26.47	
4-2	20.14	17.27	16.62	
4-3	18.77	15.94	17.75	
4-4	16.10	13.34	20.69	
4-5	18.76	14.83	23.80	
4-6	17.62	14.51	21.43	
4-7	17.72	14.89	19.01	
4-8	18.64	15.91	17.16	
4-9	18.63	15.93	16.95	
4-10	17.07	14.41	18.46	
5-4				
5-1	23.11	13.33	73.37	decay
5-2	19.29	15.87	23.04	
5-3	18.02	15.24	18.24	
5-4	21.03	17.79	18.21	
5-5	21.61	18.02	19.92	
5-6	21.85	18.55	17.79	
5-7	17.49	14.86	17.70	
5-8	32.30	20.23	59.66	decay
6-1				
6-1	18.92	15.83	21.05	
6-2	19.80	16.61	19.21	
6-3	21.15	17.67	19.69	
6-4	22.46	18.82	19.34	
6-5	20.81	17.35	19.94	
6-6	20.81	17.15	21.34	
6-7	21.81	17.83	22.32	
6-8	20.92	17.24	21.35	
6-9	29.52	21.64	36.41	
7-2				
7-1	23.68	17.63	34.32	decay
7-2	20.64	17.32	19.17	
7-3	21.93	18.39	19.25	
7-4	19.91	16.63	19.72	
7-5	19.76	16.27	21.45	
7-6	19.35	16.13	19.96	
7-7	21.54	18.26	17.96	
7-8	19.05	17.03	17.15	
7-9	10.41	8.41	23.78	

Log#	Green wt	Dry Wt	%MC	
8-3				
8-1	17.21	12.43	38.46	decay
8-2	21.77	17.65	23.36	
8-3	19.74	16.14	22.30	
8-4	18.15	14.87	22.06	
8-5	19.38	16.12	20.22	
8-6	19.46	15.96	18.64	
8-7	11.99	10.07	19.07	
9-4				
9-1	15.65	13.58	15.27	
9-2	17.69	15.20	16.38	
9-3	18.80	16.06	17.08	
9-4	17.94	15.12	18.63	
9-5	19.44	16.38	18.68	
9-6	17.49	14.79	18.26	
9-7	19.51	16.36	19.25	
9-8	22.32	17.33	28.79	
10-1				
10-1	21.93	18.36	18.90	
10-2	20.20	17.46	15.69	
10-3	18.32	15.80	15.96	
10-4	17.94	15.18	18.10	
10-5	19.33	16.56	16.80	
10-6	18.58	15.97	16.38	
10-7	18.70	16.16	15.79	
10-8	19.87	16.97	17.08	
11-2				
11-1	15.46	12.83	28.30	
11-2	19.83	16.69	18.80	
11-3	18.77	15.75	19.17	
11-4	19.58	16.58	20.51	
11-5	18.98	15.68	21.11	
11-6	19.09	16.50	21.15	
11-7	19.53	16.38	19.23	
11-8	20.97	17.68	17.25	
11-9	10.92	7.79	81.45	decay
12-3				
12-1	22.86	18.67	22.50	
12-2	22.54	18.93	19.07	
12-3	22.10	18.17	21.63	
12-4	18.24	14.82	23.08	
12-5	19.55	15.85	23.34	
12-6	19.17	15.70	22.10	
12-7	22.46	18.30	22.73	
12-8	17.21	14.29	20.52	
13-4				
13-1	15.57	13.07	26.70	
13-2	19.87	16.29	19.52	
13-3	18.63	15.79	17.99	
13-4	20.33	17.14	18.63	
13-5	15.48	12.83	20.62	
13-6	19.05	16.10	19.06	
13-7	17.60	14.69	19.81	
13-8	22.52	12.83	75.53	decay
13-9	14.54	6.62	119.64	decay
14-1				
14-1	22.77	19.04	19.59	
14-2	25.10	21.50	16.74	
14-3	24.17	20.53	17.74	
14-4	21.33	17.88	19.30	
14-5	21.86	17.66	23.52	
14-6	19.96	16.94	17.83	
14-7	20.50	17.56	16.74	
14-8	20.26	17.35	16.77	
14-9	10.97	8.91	23.12	

Log#	Green wt	Dry Wt	%MC	
15-2				
15-1	18.35	15.48	18.54	
15-2	18.26	15.52	17.65	
15-3	17.07	14.32	19.20	
15-4	19.91	16.59	20.01	
15-5	20.11	16.57	21.36	
15-6	20.09	16.64	20.77	
15-7	18.25	15.39	18.58	
15-8	20.88	17.10	22.11	
16-3				
16-1	18.95	15.87	19.43	
16-2	20.45	17.56	16.48	
16-3	18.91	16.13	17.23	
16-4	19.42	15.66	17.62	
16-5	18.35	15.33	19.70	
16-6	19.65	15.91	17.47	
16-7	21.57	18.21	17.95	
16-8	23.19	19.63	16.94	
16-9	32.31	27.32	18.25	
17-4				
17-1	18.85	13.25	82.80	decay
17-2	19.51	15.40	26.69	
17-3	19.23	15.77	21.94	
17-4	17.52	14.77	21.33	
17-5	17.32	14.21	21.88	
17-6	19.16	15.92	20.35	
17-7	18.64	15.64	19.20	
17-8	20.53	16.53	24.21	
17-9	11.44	7.32	56.28	decay
18-1				
18-1	21.92	15.03	45.84	decay
18-2	18.88	15.30	23.40	
18-3	18.74	15.42	21.53	
18-4	20.63	16.93	21.85	
18-5	21.19	17.72	19.58	
18-6	19.96	16.86	18.39	
18-7	21.09	17.79	18.83	
18-8	22.44	18.91	18.69	
18-9	22.26	18.81	18.34	
18-10	19.37	17.73	20.74	
19-2				
19-1	18.71	15.96	17.23	
19-2	18.67	16.24	14.96	
19-3	17.84	15.40	15.84	
19-4	17.25	14.62	18.29	
19-5	16.37	12.80	27.88	
19-6	16.19	13.88	16.67	
19-7	13.80	11.91	16.37	
19-8	9.96	8.48	38.71	decay
20-3				
20-1	20.15	14.41	39.83	decay
20-2	20.94	16.61	26.07	decay
20-3	18.67	14.29	30.68	
20-4	19.66	14.25	38.01	
20-5	18.96	15.94	18.92	
20-6	18.90	14.49	17.11	
20-7	19.28	16.56	16.73	
20-8	20.41	16.80	24.00	
20-9	25.84	18.67	38.40	decay

Inner/Outer Moisture Content Results
* - grand means (average of averages)

Average Moisture Contents of Outer 1-inch Section and Inner Sections

50 deg knife

Set 1 — * inner avg 20.91888
Log# — * outer avg 36.30548

knife angle	log #	location	value
50 deg knife	1-1	inner avg	26.7
50 deg knife	2-2	inner avg	21.8
50 deg knife	3-3	inner avg	19.6
50 deg knife	4-4	inner avg	21.0
50 deg knife	5-1	inner avg	22.0
50 deg knife	6-2	inner avg	23.2
50 deg knife	7-3	inner avg	19.7
50 deg knife	8-4	inner avg	24.1
50 deg knife	9-1	inner avg	18.4
50 deg knife	10-2	inner avg	16.9
50 deg knife	11-3	inner avg	21.1
50 deg knife	12-4	inner avg	23.6
50 deg knife	13-1	inner avg	21.3
50 deg knife	14-2	inner avg	19.1
50 deg knife	15-3	inner avg	20.2
50 deg knife	16-4	inner avg	18.0
50 deg knife	17-1	inner avg	26.6
50 deg knife	18-2	inner avg	20.6
50 deg knife	19-3	inner avg	16.9
50 deg knife	20-4	inner avg	17.5
Overall Average			**21.9**
50 deg knife	1-1	outer avg	75.0
50 deg knife	2-2	outer avg	22.6
50 deg knife	3-3	outer avg	40.5
50 deg knife	4-4	outer avg	24.1
50 deg knife	5-1	outer avg	63.6
50 deg knife	6-2	outer avg	41.1
50 deg knife	7-3	outer avg	30.8
50 deg knife	8-4	outer avg	30.0
50 deg knife	9-1	outer avg	20.7
50 deg knife	10-2	outer avg	22.2
50 deg knife	11-3	outer avg	48.5
50 deg knife	12-4	outer avg	28.6
50 deg knife	13-1	outer avg	47.3
50 deg knife	14-2	outer avg	23.7
50 deg knife	15-3	outer avg	24.6
50 deg knife	16-4	outer avg	29.2
50 deg knife	17-1	outer avg	65.1
50 deg knife	18-2	outer avg	40.9
50 deg knife	19-3	outer avg	20.1
50 deg knife	20-4	outer avg	27.4
Overall Average			**35.3**

60 deg knife

Set 2 — * inner avg 21.28092
Log# — * outer avg 36.04587

knife angle	log #	location	value
60 deg knife	1-2	inner avg	26.7
60 deg knife	2-3	inner avg	20.6
60 deg knife	3-4	inner avg	21.0
60 deg knife	4-1	inner avg	21.6
60 deg knife	5-2	inner avg	25.2
60 deg knife	6-3	inner avg	26.5
60 deg knife	7-4	inner avg	17.6
60 deg knife	8-1	inner avg	23.9
60 deg knife	9-2	inner avg	19.1
60 deg knife	10-3	inner avg	17.1
60 deg knife	11-4	inner avg	21.7
60 deg knife	12-1	inner avg	22.1
60 deg knife	13-2	inner avg	20.5
60 deg knife	14-3	inner avg	18.4
60 deg knife	15-4	inner avg	20.8
60 deg knife	16-1	inner avg	19.5
60 deg knife	17-2	inner avg	27.8
60 deg knife	18-3	inner avg	22.6
60 deg knife	19-4	inner avg	16.8
60 deg knife	20-1	inner avg	15.9
			21.3
60 deg knife	1-2	outer avg	64.9
60 deg knife	2-3	outer avg	23.1
60 deg knife	3-4	outer avg	35.4
60 deg knife	4-1	outer avg	34.4
60 deg knife	5-2	outer avg	51.2
60 deg knife	6-3	outer avg	49.3
60 deg knife	7-4	outer avg	25.0
60 deg knife	8-1	outer avg	28.6
60 deg knife	9-2	outer avg	27.0
60 deg knife	10-3	outer avg	31.9
60 deg knife	11-4	outer avg	36.1
60 deg knife	12-1	outer avg	22.6
60 deg knife	13-2	outer avg	55.7
60 deg knife	14-3	outer avg	22.8
60 deg knife	15-4	outer avg	22.6
60 deg knife	16-1	outer avg	34.5
60 deg knife	17-2	outer avg	60.9
60 deg knife	18-3	outer avg	52.5
60 deg knife	19-4	outer avg	19.8
60 deg knife	20-1	outer avg	22.6
			33.6

70 deg knife

Set 3 — * inner avg 20.67186
Log# — * outer avg 35.50981

knife angle	log #	location	value
70 deg knife	1-3	inner avg	22.4
70 deg knife	2-4	inner avg	20.0
70 deg knife	3-1	inner avg	17.3
70 deg knife	4-2	inner avg	20.9
70 deg knife	5-3	inner avg	19.4
70 deg knife	6-4	inner avg	21.2
70 deg knife	7-1	inner avg	19.8
70 deg knife	8-2	inner avg	22.6
70 deg knife	9-3	inner avg	18.8
70 deg knife	10-4	inner avg	17.5
70 deg knife	11-1	inner avg	22.2
70 deg knife	12-2	inner avg	23.9
70 deg knife	13-3	inner avg	20.3
70 deg knife	14-4	inner avg	19.9
70 deg knife	15-1	inner avg	20.4
70 deg knife	16-2	inner avg	18.3
70 deg knife	17-3	inner avg	23.2
70 deg knife	18-4	inner avg	21.1
70 deg knife	19-1	inner avg	18.1
70 deg knife	20-2	inner avg	16.4
			20.7
70 deg knife	1-3	outer avg	61.7
70 deg knife	2-4	outer avg	19.9
70 deg knife	3-1	outer avg	33.7
70 deg knife	4-2	outer avg	34.0
70 deg knife	5-3	outer avg	41.1
70 deg knife	6-4	outer avg	45.7
70 deg knife	7-1	outer avg	33.0
70 deg knife	8-2	outer avg	30.3
70 deg knife	9-3	outer avg	32.5
70 deg knife	10-4	outer avg	44.8
70 deg knife	11-1	outer avg	30.8
70 deg knife	12-2	outer avg	27.8
70 deg knife	13-3	outer avg	39.5
70 deg knife	14-4	outer avg	27.5
70 deg knife	15-1	outer avg	25.3
70 deg knife	16-2	outer avg	19.5
70 deg knife	17-3	outer avg	56.7
70 deg knife	18-4	outer avg	60.5
70 deg knife	19-1	outer avg	28.3
70 deg knife	20-2	outer avg	22.4
			35.5

70 deg knife - mod

Set 3 — * inner avg 19.87735
Log# — * outer avg 32.20676

knife angle	log #	location	value
70 deg knife	1-4	inner avg	24.9
70 deg knife	2-1	inner avg	18.7
70 deg knife	3-2	inner avg	18.0
70 deg knife	4-3	inner avg	19.1
70 deg knife	5-4	inner avg	19.2
70 deg knife	6-1	inner avg	20.5
70 deg knife	7-2	inner avg	19.2
70 deg knife	8-3	inner avg	21.0
70 deg knife	9-4	inner avg	18.0
70 deg knife	10-1	inner avg	16.4
70 deg knife	11-2	inner avg	19.6
70 deg knife	12-3	inner avg	21.9
70 deg knife	13-4	inner avg	27.3
70 deg knife	14-1	inner avg	18.0
70 deg knife	15-2	inner avg	19.3
70 deg knife	16-3	inner avg	17.5
70 deg knife	17-4	inner avg	22.5
70 deg knife	18-1	inner avg	20.0
70 deg knife	19-2	inner avg	17.0
70 deg knife	20-3	inner avg	19.3
			19.9
70 deg knife	1-4	outer avg	34.8
70 deg knife	2-1	outer avg	19.7
70 deg knife	3-2	outer avg	35.1
70 deg knife	4-3	outer avg	22.5
70 deg knife	5-4	outer avg	46.5
70 deg knife	6-1	outer avg	28.7
70 deg knife	7-2	outer avg	29.0
70 deg knife	8-3	outer avg	28.8
70 deg knife	9-4	outer avg	22.9
70 deg knife	10-1	outer avg	18.3
70 deg knife	11-2	outer avg	32.9
70 deg knife	12-3	outer avg	21.5
70 deg knife	13-4	outer avg	73.2
70 deg knife	14-1	outer avg	21.4
70 deg knife	15-2	outer avg	20.3
70 deg knife	16-3	outer avg	18.9
70 deg knife	17-4	outer avg	49.4
70 deg knife	18-1	outer avg	33.3
70 deg knife	19-2	outer avg	28.0
70 deg knife	20-3	outer avg	30.1
			32.2

Screen Fractions by Weight
Series 1- 50 Degree Counter Knife

Log #	1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines	Pan
1-1A	127	58	66	66	72	123	79	59
B	104	52	74	71	82	113	72	34
C	112	24	57	70	82	101	61	33
2-2A	43	35	67	87	78	104	61	31
B	110	28	70	81	80	89	56	27
C	79	43	80	96	94	95	62	36
3-3A	101	56	76	80	114	144	87	68
B	101	41	70	75	90	103	61	34
C	73	35	72	74	98	120	68	26
4-4A	43	28	41	68	82	125	81	51
B	57	64	48	99	120	161	89	49
C	36	61	54	77	122	163	91	34
5-1A	29	70	86	128	169	177	97	49
B	34	30	39	57	74	105	65	28
C	21	37	72	65	109	133	78	27
6-2A	21	51	60	83	114	139	86	34
B	13	44	77	83	114	167	90	34
C	18	33	55	56	168	166	99	46
7-3A	33	40	41	116	131	161	93	33
B	43	24	54	51	89	120	87	28
C	51	34	45	81	132	135	107	38
8-4A	78	76	60	116	152	153	81	27
B	35	38	48	62	101	129	80	35
C	47	33	74	102	120	162	83	22
9-1A	64	66	68	101	116	137	82	26
B	43	42	37	50	81	101	59	21
C	51	37	48	76	91	130	71	25
10-2A	13	51	59	117	153	215	112	32
B	23	28	61	64	117	151	102	29
C	22	39	54	80	127	151	101	33
11-3A	53	75	69	81	145	153	96	51
B	71	65	74	96	130	151	103	40
C	67	66	76	110	110	138	94	37
12-4A	140	88	63	91	104	91	42	14
B	113	90	68	82	120	97	56	25
C	98	76	74	94	121	98	55	32
13-1A	46	64	59	69	119	145	98	23
B	80	46	64	68	88	139	91	22
C	49	45	54	83	106	113	82	28
14-2A	57	55	74	78	109	139	109	22
B	75	68	72	86	113	150	100	42
C	48	27	65	94	132	151	105	21
15-3A	68	36	64	86	107	112	89	71
B	68	32	66	61	85	83	68	109
C	53	26	55	65	80	80	64	60

% Furnish in Each Screen Fraction
Series 1- 50 Degree Counter Knife

Total Wts	Log #	1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines	Pan	Fine & Pan	1.5" to 0.75"
650	1-1A	19.54	8.92	10.15	10.15	11.08	18.92	12.15	9.08	21.23	48.77
652	B	17.29	8.44	12.29	11.79	13.62	18.77	11.96	5.65	17.61	50.00
540	C	20.74	4.44	10.56	12.96	15.19	18.70	11.30	6.11	17.41	48.70
516	2-2A	8.33	6.78	12.98	16.86	15.12	20.16	11.82	6.01	17.83	48.90
541	B	20.33	5.18	12.94	14.97	14.79	16.45	10.35	4.99	15.34	53.42
588	C	13.44	7.31	13.61	16.33	15.99	16.16	10.54	6.63	17.18	50.68
726	3-3A	13.91	7.71	10.47	11.02	15.70	19.83	11.98	9.37	21.35	43.11
575	B	17.57	7.13	12.17	13.04	15.65	17.91	10.61	5.91	16.52	49.91
566	C	12.90	6.18	12.72	13.07	17.31	21.20	12.01	4.59	16.61	44.88
519	4-4A	8.29	5.39	7.90	13.10	15.80	24.08	15.61	9.83	25.43	34.68
687	B	8.30	9.32	6.99	14.41	17.47	23.44	12.95	7.13	20.09	39.01
638	C	5.64	9.56	8.46	12.07	19.12	25.55	14.26	5.33	19.59	35.74
805	5-1A	3.60	8.70	10.68	15.90	20.99	21.99	12.05	6.09	18.14	38.88
432	B	7.87	6.94	9.03	13.19	17.13	24.31	15.05	6.48	21.53	37.04
542	C	3.87	6.83	13.28	11.99	20.11	24.54	14.39	4.98	19.37	35.98
588	6-2A	3.57	8.67	10.20	14.12	19.39	23.64	14.63	5.78	20.41	36.56
622	B	2.09	7.07	12.38	13.34	18.33	26.85	14.47	5.47	19.94	34.89
641	C	2.81	5.15	8.58	8.74	26.21	25.90	15.44	7.18	22.62	25.27
648	7-3A	5.09	6.17	6.33	17.90	20.22	24.85	14.35	5.09	19.44	35.49
496	B	8.67	4.84	10.89	10.28	17.94	24.19	17.54	5.65	23.19	34.68
623	C	8.19	5.46	7.22	13.00	21.19	21.67	17.17	6.10	23.27	33.87
743	8-4A	10.50	10.23	8.08	15.61	20.46	20.59	10.90	3.63	14.54	44.41
528	B	6.63	7.20	9.09	11.74	19.13	24.43	15.15	6.63	21.78	34.66
643	C	7.31	5.13	11.51	15.86	18.66	25.19	12.91	3.42	16.33	39.81
660	9-1A	9.70	10.00	10.30	15.30	17.58	20.76	12.42	3.94	16.36	45.30
434	B	9.91	9.68	8.53	11.52	18.66	23.27	13.59	4.84	18.43	39.63
529	C	9.84	6.99	9.07	14.37	17.20	24.57	13.42	4.73	18.15	40.08
752	10-2A	1.73	6.78	7.85	15.56	20.35	28.59	14.89	4.26	19.15	31.91
575	B	4.00	4.87	10.61	11.13	20.35	26.26	17.74	5.04	22.78	30.61
607	C	3.62	6.43	8.90	13.18	20.92	24.88	16.64	5.44	22.08	32.13
723	11-3A	7.33	10.37	9.54	11.20	20.06	21.16	13.28	7.05	20.33	38.45
730	B	9.73	8.90	10.14	13.15	17.81	20.68	14.11	5.48	19.59	41.92
698	C	9.60	9.46	10.89	15.76	15.76	19.77	13.47	5.30	18.77	45.70
633	12-4A	22.12	13.90	9.95	14.38	16.43	14.38	6.64	2.21	8.85	60.35
651	B	17.36	13.82	10.45	12.60	18.43	14.90	8.60	3.84	12.44	54.22
648	C	15.12	11.73	11.42	14.51	18.67	15.12	8.49	4.94	13.43	52.78
623	13-1A	7.38	10.27	9.47	11.08	19.10	23.27	15.73	3.69	19.42	38.20
598	B	13.38	7.69	10.70	11.37	14.72	23.24	15.22	3.68	18.90	43.14
560	C	8.75	8.04	9.64	14.82	18.93	20.18	14.64	5.00	19.64	41.25
643	14-2A	8.86	8.55	11.51	12.13	16.95	21.62	16.95	3.42	20.37	41.06
706	B	10.62	9.63	10.20	12.18	16.01	21.25	14.16	5.95	20.11	42.63
643	C	7.47	4.20	10.11	14.62	20.53	23.48	16.33	3.27	19.60	36.39
633	15-3A	10.74	5.69	10.11	13.59	16.90	17.69	14.06	11.22	25.28	40.13
572	B	11.89	5.59	11.54	10.66	14.86	14.51	11.89	19.06	30.94	39.69
483	C	10.97	5.38	11.39	13.46	16.56	16.56	13.25	12.42	25.67	41.20

Screen Fractions by Weight Cont'd
Series 1- 50 Degree Counter Knife

Log #	1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines	Pan
16-4A	33	23	61	66	101	126	90	30
B	44	28	61	79	123	156	97	32
C	33	35	63	82	148	143	86	20
17-1A	198	123	105	86	77	70	54	41
B	261	130	65	72	66	87	53	37
C	100	63	66	60	56	56	42	14
18-2A	34	22	51	53	93	120	110	47
B	21	24	29	56	71	142	127	51
C	31	16	35	41	83	118	100	25
19-3A	32	20	60	72	96	120	69	41
B	48	36	55	61	105	111	70	48
C	43	13	41	54	97	112	60	51
20-4A	43	32	60	56	122	170	127	55
B	38	34	79	61	121	147	102	37
C	53	22	39	44	55	84	73	30

¼ Furnish in Each Screen Fraction Cont'd
Series 1- 50 Degree Counter Knife

Total Wts	Log #	1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines	Pan	Fine & Pan	1.5" to 0.75"
530	16-4A	6.23	4.34	11.51	12.45	19.06	23.77	16.98	5.66	22.64	34.53
620	B	7.10	4.52	9.84	12.74	19.84	25.16	15.65	5.16	20.81	34.19
610	C	5.41	5.74	10.33	13.44	24.26	23.44	14.10	3.28	17.38	34.92
754	17A	26.26	16.31	13.93	11.41	10.21	9.28	7.16	5.44	12.60	67.90
771	B	33.85	16.86	8.43	9.34	8.56	11.28	6.87	4.80	11.67	68.48
457	C	21.88	13.79	14.44	13.13	12.25	12.25	9.19	3.06	12.25	63.24
530	18-2A	6.42	4.15	9.62	10.00	17.55	22.64	20.75	8.87	29.62	30.19
521	B	4.03	4.61	5.57	10.75	13.63	27.26	24.38	9.79	34.17	24.95
449	C	6.90	3.56	7.80	9.13	18.49	26.28	22.27	5.57	27.84	27.39
510	19-3A	6.27	3.92	11.76	14.12	18.82	23.53	13.53	8.04	21.57	36.08
534	B	8.99	6.74	10.30	11.42	19.66	20.79	13.11	8.99	22.10	37.45
471	C	9.13	2.76	8.70	11.46	20.59	23.78	12.74	10.83	23.57	32.06
565	20-4A	6.47	4.81	9.02	8.42	18.35	25.56	19.10	8.27	27.37	28.72
619	B	6.14	5.49	12.76	9.85	19.55	23.75	16.48	5.98	22.46	34.25
400	C	13.25	5.50	9.75	11.00	13.75	21.00	18.25	7.50	25.75	39.50
600	Average	10.25	7.50	10.24	12.81	17.63	21.42	13.93	6.22	20.15	40.80
	St. Dev	6.26	3.05	1.88	2.18	3.08	4.15	3.40	2.72	4.68	9.38

Screen Fractions by Weight
Series 2- 60 Degree Counter Knife

Log #	1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines	Pan
1-2A	204	45	57	67	76	72	43	18
B	168	41	63	52	75	71	38	18
C	175	37	52	57	78	89	61	35
2-3A	142	32	57	80	89	110	62	34
B	153	45	77	75	88	87	49	21
C	233	54	42	69	72	75	42	19
3-4A	95	24	45	67	84	102	70	32
B	105	21	36	67	72	84	61	19
C	125	24	55	58	65	89	75	45
4-1A	96	34	71	78	113	154	113	53
B	67	27	60	58	71	108	64	25
C	158	58	70	80	82	115	81	45
5-2A	122	40	82	91	106	116	54	16
B	97	44	62	86	96	84	62	24
C	112	50	59	66	94	83	60	28
6-3A	78	48	79	143	136	149	107	58
B	107	41	66	69	69	110	73	39
C	112	41	33	65	94	94	80	27
7-4A	90	18	41	43	117	107	69	18
B	70	40	77	83	105	143	105	53
C	69	26	51	46	116	123	97	30
8-1A	158	80	94	95	108	145	108	46
B	141	61	77	90	114	130	95	44
C	166	43	55	64	68	84	59	25
9-2A	81	38	54	62	101	125	71	30
B	50	30	40	51	70	96	78	30
C	80	21	28	44	69	104	79	29
10-3A	61	21	55	67	90	116	85	38
B	84	30	46	72	98	128	80	43
C	55	24	43	59	74	106	75	37
11-4A	85	45	53	68	92	107	82	48
B	83	53	65	62	79	104	71	35
C	129	61	56	59	58	84	66	34
12-1A	135	37	75	81	128	123	65	27
B	78	25	71	65	64	86	69	21
C	79	43	45	69	87	84	57	27
13-2A	97	75	68	94	101	136	91	32
B	94	56	59	66	110	118	86	28
C	80	31	55	57	74	88	73	32
14-3A	108	38	51	77	94	137	127	36
B	120	36	68	70	93	130	99	29
C	147	35	52	69	95	144	147	38

% Furnish in Each Fraction

Total Wts	Log #	1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines	Pan	%	Fine & Pan	1.5" to 0.75"
582	1-2A	35.05	7.73	9.79	11.51	13.06	12.37	7.39	3.09	100.00	10.48	64.09
526	B	31.94	7.79	11.98	9.89	14.26	13.50	7.22	3.42	100.00	10.65	61.60
585	C	29.91	6.32	8.89	9.74	13.33	15.21	10.43	6.15	100.00	16.58	54.87
606	2-3A	23.43	5.28	9.41	13.20	14.69	18.15	10.23	5.61	100.00	15.84	51.32
595	B	25.71	7.56	12.94	12.61	14.79	14.62	8.24	3.53	100.00	11.76	58.82
606	C	38.45	8.91	6.93	11.39	11.88	12.38	6.93	3.14	100.00	10.07	65.68
519	3-4A	18.30	4.62	8.67	12.91	16.18	19.65	13.49	6.17	100.00	19.65	44.51
465	B	22.58	4.52	7.74	14.41	15.48	18.06	13.12	4.09	100.00	17.20	49.25
536	C	23.32	4.48	10.26	10.82	12.13	16.60	13.99	8.40	100.00	22.39	48.88
710	4-1A	13.52	4.79	10.00	10.70	15.92	21.69	15.92	7.46	100.00	23.38	39.01
480	B	13.96	5.63	12.50	12.08	14.79	22.50	13.33	5.21	100.00	18.54	44.17
689	C	22.93	8.42	10.16	11.61	11.90	16.69	11.76	6.53	100.00	18.29	53.12
627	5-2A	19.46	6.38	13.08	14.51	16.91	18.50	8.61	2.55	100.00	11.16	53.43
555	B	17.48	7.93	11.17	15.50	17.30	15.14	11.17	4.32	100.00	15.50	52.07
552	C	20.29	9.06	10.69	11.96	17.03	15.04	10.87	5.07	100.00	15.94	51.99
798	6-3A	9.77	6.02	9.90	17.92	17.04	18.67	13.41	7.27	100.00	20.68	43.61
574	B	18.64	7.14	11.50	12.02	12.02	19.16	12.72	6.79	100.00	19.51	49.30
586	C	20.51	7.51	6.04	11.90	17.22	17.22	14.65	4.95	100.00	19.60	45.97
503	7-4A	17.89	3.58	8.15	8.55	23.26	21.27	13.72	3.58	100.00	17.30	38.17
676	B	10.36	5.92	11.39	12.28	15.53	21.15	15.53	7.84	100.00	23.37	39.94
560	C	12.32	4.64	9.11	8.21	21.07	21.96	17.32	5.36	100.00	22.68	34.29
834	8-1A	18.94	9.59	11.27	11.39	12.95	17.39	12.95	5.52	100.00	18.47	51.20
752	B	18.75	8.11	10.24	11.97	15.16	17.29	12.63	5.85	100.00	18.48	49.07
584	C	31.85	7.36	9.42	10.96	11.64	14.38	10.10	4.28	100.00	14.38	59.59
562	9-2A	14.41	6.76	9.61	11.03	17.97	22.24	12.63	5.34	100.00	17.97	41.81
445	B	11.24	6.74	8.99	11.46	15.73	21.57	17.53	6.74	100.00	24.27	38.43
454	C	17.62	4.63	6.17	9.69	15.20	22.91	17.40	6.39	100.00	23.79	38.11
533	10-3A	11.44	3.94	10.32	12.57	16.89	21.76	15.95	7.13	100.00	23.08	38.27
581	B	14.46	5.16	7.92	12.39	16.87	22.03	13.77	7.40	100.00	21.17	39.93
473	C	11.63	5.07	9.09	12.47	15.64	22.41	15.86	7.82	100.00	23.68	38.27
580	11-4A	14.66	7.76	9.14	11.72	15.86	18.45	14.14	8.28	100.00	22.41	43.28
553	B	15.01	9.58	11.75	11.21	14.29	18.81	12.84	6.51	100.00	19.35	47.56
547	C	23.58	11.15	10.24	10.79	10.60	15.36	12.07	6.22	100.00	18.28	55.76
671	12-1A	20.12	5.51	11.18	12.07	19.08	18.33	9.69	4.02	100.00	13.71	48.88
479	B	16.28	5.22	14.82	13.57	13.36	17.95	14.41	4.38	100.00	18.79	49.90
491	C	16.09	8.76	9.16	14.05	17.72	17.11	11.61	5.50	100.00	17.11	48.07
692	13-2A	14.02	10.84	9.54	13.58	14.60	19.65	13.15	4.62	100.00	17.77	47.98
617	B	15.24	9.08	9.56	10.70	17.83	19.12	13.94	4.54	100.00	18.48	44.57
490	C	16.33	6.33	11.22	11.63	15.10	17.96	14.90	6.53	100.00	21.43	45.51
668	14-3A	16.17	5.69	7.63	11.53	14.07	20.51	19.01	5.39	100.00	24.40	41.02
645	B	18.60	5.58	10.54	10.85	14.42	20.16	15.35	4.50	100.00	19.84	45.58
727	C	20.22	4.81	7.15	9.49	13.07	19.81	20.22	5.23	100.00	25.45	41.68

Screen Fractions by Weight Cont'd

Series 2- 58 Degree Counter Knife

Log #	1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines	Pan
15-4A	41	16	64	49	67	91	69	40
B	128	27	69	68	80	80	62	40
C	158	36	58	69	69	81	65	41
16-1A	115	60	58	91	90	112	94	29
B	90	61	71	85	136	137	117	37
C	94	54	77	92	113	121	85	27
17-2A	224	44	44	61	71	95	53	23
B	120	44	41	53	70	75	48	22
C	224	49	115	90	103	107	69	28
18-3A	54	21	49	63	84	122	109	48
B	59	27	35	79	113	134	112	32
C	82	18	75	84	113	134	128	37
19-4A	111	31	45	50	53	69	56	43
B	123	33	49	74	86	113	63	37
C	113	89	48	47	57	89	70	38
20-1A	89	45	59	88	136	153	92	38
B	56	29	51	82	101	130	80	35
C	105	34	57	82	95	135	90	29

% Furnish in Each Fraction Cont'd

Total Wts	Log #	1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines	Pan	%	Fine & Pan	1.5" to 0.75"
437	15-4A	9.38	3.66	14.65	11.21	15.33	20.82	15.79	9.15	100.00	24.94	35.90
554	B	23.10	4.87	12.45	12.27	14.44	14.44	11.19	7.22	100.00	18.41	52.71
577	C	27.38	6.24	10.05	11.96	11.96	14.04	11.27	7.11	100.00	18.37	55.63
649	16-1A	17.72	9.24	8.94	14.02	13.87	17.26	14.48	4.47	100.00	18.95	49.92
740	B	12.16	8.24	9.59	12.03	18.65	18.51	15.81	5.00	100.00	20.81	42.03
663	C	14.18	8.14	11.61	13.88	17.04	18.25	12.82	4.07	100.00	16.89	47.81
615	17-2A	36.42	7.15	7.15	9.92	11.54	15.45	8.62	3.74	100.00	12.36	60.65
473	B	25.37	9.30	8.67	11.21	14.80	15.86	10.15	4.65	100.00	14.80	54.55
785	C	28.54	6.24	14.65	11.46	13.12	13.63	8.79	3.57	100.00	12.36	60.89
550	18-3A	9.82	3.82	8.91	11.45	15.27	22.18	19.82	8.73	100.00	28.55	34.00
591	B	9.98	4.57	5.92	13.37	19.12	22.67	16.95	5.41	100.00	24.37	33.84
671	C	12.22	2.68	11.16	12.52	16.84	19.97	19.08	5.51	100.00	24.59	38.60
416	19-4A	24.24	6.77	9.83	10.92	11.57	15.07	12.23	9.39	100.00	21.62	51.75
578	B	21.28	5.71	8.48	12.80	14.88	19.55	10.90	6.40	100.00	17.30	48.27
551	C	20.51	16.15	6.71	8.53	10.34	16.15	12.70	6.90	100.00	19.60	53.90
700	20-1A	12.71	6.43	8.43	12.57	19.43	21.86	13.14	5.43	100.00	18.57	40.14
568	B	10.56	5.11	8.98	14.44	17.78	22.89	14.08	6.16	100.00	20.25	39.08
627	C	16.75	5.42	9.09	13.08	15.15	21.53	14.35	4.63	100.00	18.98	44.34
	Average	18.91	6.69	9.88	11.94	15.25	18.41	13.24	5.67		18.91	47.43
	St. Dev	6.96	2.27	1.97	1.69	2.56	2.94	3.14	1.60		4.12	7.79

Screen Fractions by Weight Cont'd

Series 3- 70 Degree Counter Knife

Log #	1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines	Pan
1-3A	168	45	91	55	73	80	62	53
B	178	91	61	78	91	117	81	45
C	170	61	40	61	64	74	53	35
2-4A	107	57	36	48	50	74	59	41
B	190	37	29	51	56	74	58	47
C	230	47	54	77	91	124	80	59
3-1A	180	72	72	84	88	136	77	42
B	109	35	68	89	101	136	79	36
C	106	35	44	59	79	103	58	29
4-2A	110	46	71	93	90	136	84	42
B	97	44	64	89	87	111	90	32
C	77	42	37	66	102	137	93	53
5-3A	88	30	45	59	76	98	84	46
B	170	95	75	115	123	159	97	36
C	61	48	40	67	69	100	63	28
6-4A	87	33	58	71	112	136	87	45
B	95	24	57	55	101	128	80	27
C	129	33	65	79	93	125	77	39
7-1A	60	40	65	89	90	151	97	60
B	117	32	70	80	85	121	71	26
C	57	44	63	57	90	132	92	30
8-2A	66	28	31	50	70	97	87	38
B	109	31	55	62	85	102	71	34
C	57	32	34	49	80	99	75	37
9-3A	94	30	68	87	88	106	78	61
B	77	30	59	56	54	74	55	45
C	69	25	57	74	87	120	79	52
10-4A	61	19	44	56	86	122	76	35
B	54	19	51	73	94	139	110	75
C	89	31	48	62	109	122	78	31
11-1A	111	36	63	49	82	86	58	53
B	136	47	47	56	54	73	55	27
C	144	35	58	53	69	81	66	53
12-2A	156	97	85	104	97	111	67	27
B	94	43	78	73	99	101	60	29
C	116	53	62	92	102	126	66	33
13-3A	98	44	69	75	118	153	97	44
B	67	35	38	49	64	84	53	17
C	72	24	47	56	78	96	71	27
14-4A	79	19	48	87	89	152	97	32
B	50	10	64	76	115	145	109	44
C	52	18	62	75	133	154	126	36

% Furnish in Each Fraction Cont'd

Total Wts	Log #	1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines	Pan	%	Fine & Pan	1.5" to 0.75"
627	1-3A	26.79	7.18	14.51	8.77	11.64	12.76	9.89	8.45	100.00	18.34	57.26
742	B	23.99	12.26	8.22	10.51	12.26	15.77	10.92	6.06	100.00	16.98	54.99
558	C	30.47	10.93	7.17	10.93	11.47	13.26	9.50	6.27	100.00	15.77	59.50
472	2-4A	22.67	12.08	7.63	10.17	10.59	15.68	12.50	8.69	100.00	21.19	52.54
542	B	35.06	6.83	5.35	9.41	10.33	13.65	10.70	8.67	100.00	19.37	56.64
762	C	30.18	6.17	7.09	10.10	11.94	16.27	10.50	7.74	100.00	18.24	53.54
751	3-1A	23.97	9.59	9.59	11.19	11.72	18.11	10.25	5.59	100.00	15.85	54.33
653	B	16.69	5.36	10.41	13.63	15.47	20.83	12.10	5.51	100.00	17.61	46.09
513	C	20.66	6.82	8.58	11.50	15.40	20.08	11.31	5.65	100.00	16.96	47.56
672	4-2A	16.37	6.85	10.57	13.84	13.39	20.24	12.50	6.25	100.00	18.75	47.62
614	B	15.80	7.17	10.42	14.50	14.17	18.08	14.66	5.21	100.00	19.87	47.88
607	C	12.69	6.92	6.10	10.87	16.80	22.57	15.32	8.73	100.00	24.05	36.57
526	5-3A	16.73	5.70	8.56	11.22	14.45	18.63	15.97	8.75	100.00	24.71	42.21
870	B	19.54	10.92	8.62	13.22	14.14	18.28	11.15	4.14	100.00	15.29	52.30
476	C	12.82	10.08	8.40	14.08	14.50	21.01	13.24	5.88	100.00	19.12	45.38
629	6-4A	13.83	5.25	9.22	11.29	17.81	21.62	13.83	7.15	100.00	20.99	39.59
567	B	16.75	4.23	10.05	9.70	17.81	22.57	14.11	4.76	100.00	18.87	40.74
640	C	20.16	5.16	10.16	12.34	14.53	19.53	12.03	6.09	100.00	18.13	47.81
652	7-1A	9.20	6.13	9.97	13.65	13.80	23.16	14.88	9.20	100.00	24.08	38.96
602	B	19.44	5.32	11.63	13.29	14.12	20.10	11.79	4.32	100.00	16.11	49.67
565	C	10.09	7.79	11.15	10.09	15.93	23.36	16.28	5.31	100.00	21.59	39.12
467	8-2A	14.13	6.00	6.64	10.71	14.99	20.77	18.63	8.14	100.00	26.77	37.47
549	B	19.85	5.65	10.02	11.29	15.48	18.58	12.93	6.19	100.00	19.13	46.81
463	C	12.31	6.91	7.34	10.58	17.28	21.38	16.20	7.99	100.00	24.19	37.15
612	9-3A	15.36	4.90	11.11	14.22	14.38	17.32	12.75	9.97	100.00	22.71	45.59
450	B	17.11	6.67	13.11	12.44	12.00	16.44	12.22	10.00	100.00	22.22	49.33
563	C	12.26	4.44	10.12	13.14	15.45	21.31	14.03	9.24	100.00	23.27	39.98
499	10-4A	12.22	3.81	8.82	11.22	17.23	24.45	15.23	7.01	100.00	22.24	36.07
615	B	8.78	3.09	8.29	11.87	15.28	22.60	17.89	12.20	100.00	30.08	32.03
570	C	15.61	5.44	8.42	10.88	19.12	21.40	13.68	5.44	100.00	19.12	40.35
538	11-1A	20.63	6.69	11.71	9.11	15.24	15.99	10.78	9.85	100.00	20.63	48.14
495	B	27.47	9.49	9.49	11.31	10.91	14.75	11.11	5.45	100.00	16.57	57.78
559	C	25.76	6.26	10.38	9.48	12.34	14.49	11.81	9.48	100.00	21.29	51.88
744	12-2A	20.97	13.04	11.42	13.98	13.04	14.92	9.01	3.63	100.00	12.63	59.41
577	B	16.29	7.45	13.52	12.65	17.16	17.50	10.40	5.03	100.00	15.42	49.91
650	C	17.85	8.15	9.54	14.15	15.69	19.38	10.15	5.08	100.00	15.23	49.69
698	13-3A	14.04	6.30	9.89	10.74	16.91	21.92	13.90	6.30	100.00	20.20	40.97
407	B	16.46	8.60	9.34	12.04	15.72	20.64	13.02	4.18	100.00	17.20	46.44
471	C	15.29	5.10	9.98	11.89	16.56	20.38	15.07	5.73	100.00	20.81	42.25
603	14-4A	13.10	3.15	7.96	14.43	14.76	25.21	16.09	5.31	100.00	21.39	38.64
613	B	8.16	1.63	10.44	12.40	18.76	23.65	17.78	7.18	100.00	24.96	32.63
656	C	7.93	2.74	9.45	11.43	20.27	23.48	19.21	5.49	100.00	24.70	31.55

Screen Fractions by Weight Cont'd

Series 3- 70 Degree Counter Knife

15-1A	149	36	51	57	76	83	61	33
B	183	39	54	52	73	85	57	29
C	105	24	51	52	75	83	52	22
16-2A	46	15	63	51	64	79	61	21
B	71	22	65	82	94	108	64	21
C	72	15	44	77	114	135	68	12
17-3A	110	56	54	59	61	85	49	18
B	102	43	104	70	121	124	97	45
C	146	49	42	72	96	86	56	26
18-4A	75	30	79	73	112	119	85	30
B	32	10	51	59	118	149	98	36
C	43	23	91	66	138	148	91	53
19-1A	126	49	66	62	93	119	85	55
B	64	35	42	55	70	94	69	55
C	73	10	46	44	55	82	60	44
20-2A	41	19	34	60	84	129	102	38
B	42	12	38	48	111	136	84	20
C	37	23	63	72	115	186	127	72

% Furnish in Each Fraction Cont'd

546	15-1A	27.29	6.59	9.34	10.44	13.92	15.20	11.17	6.04	100.00	17.22	53.66
572	B	31.99	6.82	9.44	9.09	12.76	14.86	9.97	5.07	100.00	15.03	57.34
464	C	22.63	5.17	10.99	11.21	16.16	17.89	11.21	4.74	100.00	15.95	50.00
400	16-2A	11.50	3.75	15.75	12.75	16.00	19.75	15.25	5.25	100.00	20.50	43.75
527	B	13.47	4.17	12.33	15.56	17.84	20.49	12.14	3.98	100.00	16.13	45.54
537	C	13.41	2.79	8.19	14.34	21.23	25.14	12.66	2.23	100.00	14.90	38.73
492	17-3A	22.36	11.38	10.98	11.99	12.40	17.28	9.96	3.66	100.00	13.62	56.71
706	B	14.45	6.09	14.73	9.92	17.14	17.56	13.74	6.37	100.00	20.11	45.18
573	C	25.48	8.55	7.33	12.57	16.75	15.01	9.77	4.54	100.00	14.31	53.93
603	18-4A	12.44	4.98	13.10	12.11	18.57	19.73	14.10	4.98	100.00	19.07	42.62
553	B	5.79	1.81	9.22	10.67	21.34	26.94	17.72	6.51	100.00	24.23	27.49
653	C	6.58	3.52	13.94	10.11	21.13	22.66	13.94	8.12	100.00	22.05	34.15
655	19-1A	19.24	7.48	10.08	9.47	14.20	18.17	12.98	8.40	100.00	21.37	46.26
484	B	13.22	7.23	8.68	11.36	14.46	19.42	14.26	11.36	100.00	25.62	40.50
414	C	17.63	2.42	11.11	10.63	13.29	19.81	14.49	10.63	100.00	25.12	41.79
507	20-2A	8.09	3.75	6.71	11.83	16.57	25.44	20.12	7.50	100.00	27.61	30.37
491	B	8.55	2.44	7.74	9.78	22.61	27.70	17.11	4.07	100.00	21.18	28.51
695	C	5.32	3.31	9.06	10.36	16.55	26.76	18.27	10.36	100.00	28.63	28.06
		Average	17.08	6.28	9.82	11.64	15.40	19.70	13.40	6.69		20.09	44.82
		St. Dev.	6.82	2.67	2.15	1.62	2.78	3.60	2.71	2.17		3.93	8.41

Screen Fractions by Weight
Series 4- 70 Degree Counter Knife - Modified

Log #	1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines	Pan
1-4A	111	40	44	66	87	121	63	22
B	263	81	60	82	73	93	47	13
C	107	54	52	68	86	123	69	26
2-1A	57	27	49	69	113	129	86	29
B	38	12	39	50	88	103	62	18
C	87	43	54	79	89	121	66	22
3-2A	75	17	64	80	116	129	96	48
B	51	16	56	75	105	116	67	27
C	58	30	70	69	87	100	68	25
4-3A	20	22	52	49	89	122	88	32
B	7	5	14	34	63	131	106	50
C	21	10	45	55	88	145	110	47
5-4A	40	17	54	44	87	132	116	45
B	25	16	29	63	93	140	126	53
C	16	18	37	51	79	118	114	40
6-1A	105	35	58	86	92	130	102	56
B	61	19	28	38	55	97	84	44
C	77	22	30	34	58	76	83	44
7-2A	25	26	56	71	96	149	109	45
B	31	20	49	66	107	171	111	33
C	29	5	28	59	95	141	116	53
8-3A	40	8	32	37	87	101	107	44
B	70	12	44	37	70	105	94	48
C	27	8	34	53	102	155	110	45
9-4A	40	31	23	50	68	95	78	26
B	29	14	26	50	58	104	91	56
C	19	17	26	39	62	92	112	63
10-1A	13	17	34	43	95	138	132	89
B	12	16	33	39	84	125	109	47
C	22	10	22	45	78	146	108	40
11-2A	61	33	17	54	63	129	97	35
B	53	16	51	36	80	100	91	45
C	48	7	31	51	80	104	96	37
12-3A	71	31	58	79	107	132	89	27
B	68	30	50	51	84	98	55	11
C	43	39	40	88	100	127	78	21
13-4A	42	22	36	41	68	119	108	34
B	25	25	19	49	66	109	103	41
C	46	21	27	50	76	128	117	55
14-1A	12	11	52	61	90	124	113	52
B	15	4	24	41	73	111	124	27
C	18	12	31	42	98	138	123	58

% Furnish in Each Fraction

Total Wts	Log #	1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines	Pan	%	Fine & Pan	1.5" to 0.75"
554	1-4A	20.04	7.22	7.94	11.91	15.70	21.84	11.37	3.97	100.00	15.34	47.11
712	B	36.94	11.38	8.43	11.52	10.25	13.06	6.60	1.83	100.00	8.43	68.26
585	C	18.29	9.23	8.89	11.62	14.70	21.03	11.79	4.44	100.00	16.24	48.03
559	2-1A	10.20	4.83	8.77	12.34	20.21	23.08	15.38	5.19	100.00	20.57	36.14
410	B	9.27	2.93	9.51	12.20	21.46	25.12	15.12	4.39	100.00	19.51	33.90
561	C	15.51	7.66	9.63	14.08	15.86	21.57	11.76	3.92	100.00	15.69	46.88
625	3-2A	12.00	2.72	10.24	12.80	18.56	20.64	15.36	7.68	100.00	23.04	37.76
513	B	9.94	3.12	10.92	14.62	20.47	22.61	13.06	5.26	100.00	18.32	38.60
507	C	11.44	5.92	13.81	13.61	17.16	19.72	13.41	4.93	100.00	18.34	44.77
474	4-3A	4.22	4.64	10.97	10.34	18.78	25.74	18.57	6.75	100.00	25.32	30.17
410	B	1.71	1.22	3.41	8.29	15.37	31.95	25.85	12.20	100.00	38.05	14.63
521	C	4.03	1.92	8.64	10.56	16.89	27.83	21.11	9.02	100.00	30.13	25.14
535	5-4A	7.48	3.18	10.09	8.22	16.26	24.67	21.68	8.41	100.00	30.09	28.97
545	B	4.59	2.94	5.32	11.56	17.06	25.69	23.12	9.72	100.00	32.84	24.40
473	C	3.38	3.81	7.82	10.78	16.70	24.95	24.10	8.46	100.00	32.56	25.79
664	6-1A	15.81	5.27	8.73	12.95	13.86	19.58	15.36	8.43	100.00	23.80	42.77
426	B	14.32	4.46	6.57	8.92	12.91	22.77	19.72	10.33	100.00	30.05	34.27
424	C	18.16	5.19	7.08	8.02	13.68	17.92	19.58	10.38	100.00	29.95	38.44
577	7-2A	4.33	4.51	9.71	12.31	16.64	25.82	18.89	7.80	100.00	26.69	30.85
588	B	5.27	3.40	8.33	11.22	18.20	29.08	18.88	5.61	100.00	24.49	28.23
526	C	5.51	0.95	5.32	11.22	18.06	26.81	22.05	10.08	100.00	32.13	23.00
456	8-3A	8.77	1.75	7.02	8.11	19.08	22.15	23.46	9.65	100.00	33.11	25.66
480	B	14.58	2.50	9.17	7.71	14.58	21.88	19.58	10.00	100.00	29.58	33.96
534	C	5.06	1.50	6.37	9.93	19.10	29.03	20.60	8.43	100.00	29.03	22.85
411	9-4A	9.73	7.54	5.60	12.17	16.55	23.11	18.98	6.33	100.00	25.30	35.04
428	B	6.78	3.27	6.07	11.68	13.55	24.30	21.26	13.08	100.00	34.35	27.80
430	C	4.42	3.95	6.05	9.07	14.42	21.40	26.05	14.65	100.00	40.70	23.49
561	10-1A	2.32	3.03	6.06	7.66	16.93	24.60	23.53	15.86	100.00	39.39	19.07
465	B	2.58	3.44	7.10	8.39	18.06	26.88	23.44	10.11	100.00	33.55	21.51
471	C	4.67	2.12	4.67	9.55	16.56	31.00	22.93	8.49	100.00	31.42	21.02
489	11-2A	12.47	6.75	3.48	11.04	12.88	26.38	19.84	7.16	100.00	26.99	33.74
472	B	11.23	3.39	10.81	7.63	16.95	21.19	19.28	9.53	100.00	28.81	33.05
454	C	10.57	1.54	6.83	11.23	17.62	22.91	21.15	8.15	100.00	29.30	30.18
594	12-3A	11.95	5.22	9.76	13.30	18.01	22.22	14.98	4.55	100.00	19.53	40.24
447	B	15.21	6.71	11.19	11.41	18.79	21.92	12.30	2.46	100.00	14.77	44.52
536	C	8.02	7.28	7.46	16.42	18.66	23.69	14.55	3.92	100.00	18.47	39.18
470	13-4A	8.94	4.68	7.66	8.72	14.47	25.32	22.98	7.23	100.00	30.21	30.00
439	B	5.92	5.92	4.33	11.16	15.03	24.83	23.46	9.34	100.00	32.80	27.33
520	C	8.85	4.04	5.19	9.62	14.62	24.62	22.50	10.58	100.00	33.08	27.69
515	14-1A	2.33	2.14	10.10	11.84	17.48	24.08	21.94	10.10	100.00	32.04	26.41
419	B	3.58	0.95	5.73	9.79	17.42	26.49	29.59	6.44	100.00	36.04	20.05
520	C	3.46	2.31	5.96	8.08	18.85	26.54	23.65	11.15	100.00	34.81	19.81

Screen Fractions by Weight Cont'd
Series 4- 70 Degree Counter Knife - Modified

15-2A	91	27	41	61	102	118	84	31
B	62	30	39	32	57	97	69	26
C	113	26	46	51	72	106	67	25
16-3A	14	15	30	36	81	133	125	22
B	13	15	28	42	73	90	104	32
C	30	24	62	69	97	180	149	44
17-4A	59	48	69	77	81	95	89	22
B	87	42	64	76	98	112	83	31
C	60	47	60	73	73	110	102	27
18-1A	11	27	63	42	123	169	152	63
B	17	12	14	30	61	148	123	61
C	18	9	24	38	74	139	157	118
19-2A	38	12	28	33	74	114	93	49
B	59	16	54	67	94	136	103	79
C	49	16	28	44	63	104	84	35
20-3A	19	9	29	54	91	131	111	68
B	42	10	26	42	75	145	125	101
C	62	12	35	57	105	138	106	72

% Furnish in Each Fraction Cont'd

555	15-2A	16.40	4.86	7.39	10.99	18.38	21.26	15.14	5.59	100.00	20.72	39.64
412	B	15.05	7.28	9.47	7.77	13.83	23.54	16.75	6.31	100.00	23.06	39.56
506	C	22.33	5.14	9.09	10.08	14.23	20.95	13.24	4.94	100.00	18.18	46.64
456	16-3A	3.07	3.29	6.58	7.89	17.76	29.17	27.41	4.82	100.00	32.24	20.83
397	B	3.27	3.78	7.05	10.58	18.39	22.67	26.20	8.06	100.00	34.26	24.69
655	C	4.58	3.66	9.47	10.53	14.81	27.48	22.75	6.72	100.00	29.47	28.24
540	17-4A	10.93	8.89	12.78	14.26	15.00	17.59	16.48	4.07	100.00	20.56	46.85
593	B	14.67	7.08	10.79	12.82	16.53	18.89	14.00	5.23	100.00	19.22	45.36
552	C	10.87	8.51	10.87	13.22	13.22	19.93	18.48	4.89	100.00	23.37	43.48
650	18-1A	1.69	4.15	9.69	6.46	18.92	26.00	23.38	9.69	100.00	33.08	22.00
466	B	3.65	2.58	3.00	6.44	13.09	31.76	26.39	13.09	100.00	39.48	15.67
577	C	3.12	1.56	4.16	6.59	12.82	24.09	27.21	20.45	100.00	47.66	15.42
441	19-2A	8.62	2.72	6.35	7.48	16.78	25.85	21.09	11.11	100.00	32.20	25.17
608	B	9.70	2.63	8.88	11.02	15.46	22.37	16.94	12.99	100.00	29.93	32.24
423	C	11.58	3.78	6.62	10.40	14.89	24.59	19.86	8.27	100.00	28.13	32.39
512	20-3A	3.71	1.76	5.66	10.55	17.77	25.59	21.68	13.28	100.00	34.96	21.68
566	B	7.42	1.77	4.59	7.42	13.25	25.62	22.08	17.84	100.00	39.93	21.20
587	C	10.56	2.04	5.96	9.71	17.89	23.51	18.06	12.27	100.00	30.32	28.28
	Average	9.25	4.20	7.75	10.46	16.36	23.95	19.60	8.43		28.03	31.67
	St. Dev.	6.27	2.31	2.38	2.23	2.27	3.46	4.74	3.71		7.67	10.29

Appendix II

Data from Log Conditioning and Vacuum-Pressure Tests

Log diameters, moisture and densities taken before log storage tests

Green Aspen and Pine

SAMPLE#	Wet Wt (gms)	VOLUME (cm^3)	BUTT DIAMETER (in)	TIP DIAMETER (in)	AVERAGE DIAMETER (in)	DENSITY (gm/cm^3)	DENSITY (lbs/cu.ft)	Dry Wt. (gm)	MC% Dry Base	Specific Gravity
Aspen1	699	1148	9.88	9.38	9.63	0.609	37.99	383	82.5	0.334
Aspen2	767	1412	10.38	9.38	9.88	0.543	33.90	507	51.3	0.359
Aspen3	936	1562	10.20	9.75	9.98	0.599	37.39	560	67.1	0.359
Aspen4	1166	1907	10.50	10.00	10.25	0.611	38.15	753	54.8	0.395
Aspen5	1086	1913	7.50	6.00	6.75	0.568	35.42	717	51.5	0.375
Average					***9.30***	***0.586***	***36.57***	***584***	***61.4***	***0.364***
St. Dev.					***1.44***	***0.030***	***1.85***	***153***	***13.4***	***0.023***
Pine1	557	913	8.00	7.20	7.60	0.610	38.07	408	36.5	0.447
Pine2	751	1232	9.75	7.50	8.63	0.610	38.04	553	35.8	0.449
Pine3	573	972	8.50	7.00	7.75	0.590	36.79	410	39.8	0.422
Pine4	624	946	8.25	7.00	7.63	0.660	41.16	438	42.5	0.463
Pine5	504	842	11.00	10.20	10.60	0.599	37.35	364	38.5	0.432
Average					***8.44***	***0.613***	***38.28***	***435***	***38.6***	***0.443***
St. Dev.					***1.28***	***0.027***	***1.70***	***71***	***2.7***	***0.016***

Mountain Pine Beetle

SAMPLE#	Wet Wt (gms)	VOLUME (cm^3)	BUTT DIAMETER (in)	TIP DIAMETER (in)	AVERAGE DIAMETER (in)	DENSITY (gm/cm^3)	DENSITY (lbs/cu.ft)	Dry Wt. (gm)	MC% Dry Base	Specific Gravity
1	737	1276	8.50	7.63	8.07	0.578	36.04	619	19.1	0.485
2	885	1877	9.75	7.25	8.50	0.471	29.42	756	17.1	0.403
3	524	926	8.88	8.00	8.44	0.566	35.31	443	18.3	0.478
4	740	1472	8.13	9.25	8.69	0.503	31.37	633	16.9	0.430
5	952	1885	10.25	9.75	10.00	0.505	31.51	813	17.1	0.431
6	690	1365	9.13	8.75	8.94	0.505	31.54	575	20.0	0.421
7	1060	1772	10.75	9.75	10.25	0.598	37.33	879	20.6	0.496
8	568	1177	9.75	8.88	9.32	0.483	30.11	468	21.4	0.398
9	636	1245	9.50	8.75	9.13	0.511	31.88	534	19.1	0.429
10	976	1610	9.75	9.38	9.57	0.606	37.83	782	24.8	0.486
11	1143	1993	10.38	10.25	10.32	0.574	35.79	935	22.2	0.469
12	890	1668	11.25	9.00	10.13	0.534	33.29	747	19.1	0.448
13	1541	2532	11.25	10.63	10.94	0.609	37.98	1237	24.6	0.489
14	1104	1933	10.50	9.25	9.88	0.571	35.64	944	16.9	0.488
15	801	1435	9.63	9.13	9.38	0.558	34.83	649	23.4	0.452
16	734	1282	8.75	8.38	8.57	0.573	35.73	604	21.5	0.471
17	918	1620	9.75	9.00	9.38	0.567	35.36	788	16.5	0.486
18	623	1091	9.00	8.50	8.75	0.571	35.63	541	15.2	0.496
19	829	1572	10.25	9.63	9.94	0.527	32.91	680	21.9	0.433
20	440	791	8.00	8.00	8.00	0.556	34.71	385	14.3	0.487
Average					***9.31***	***0.548***	***34.21***		***19.5***	***0.459***
St. Dev.					***0.81***	***0.041***	***2.54***		***3.0***	***0.032***

Log diameters, moisture and densities taken after stranding

(50 degree counter knife angle throughout stranding)

Control - Aspen

SAMPLE#	Wet Wt (gms)	VOLUME (cm^3)	INITIAL DIAMETER (in)	INITIAL DIAMETER (in)	AVERAGE DIAMETER (in)	DENSITY (gm/cm^3)	DENSITY (lbs/cu.ft)	Dry Wt. (gm)	MC% Dry Base	Specific Gravity
A1-1	544.77	1020	9.38	10.25	9.82	0.534	33.33	346.80	57.1	0.340
A1-2	564.97	1010	9.25	10.25	9.75	0.559	34.91	341.70	65.3	0.338
A1-3	664.07	1180	9.88	9.00	9.44	0.563	35.12	409.75	62.1	0.347
A1-4	507.42	945	9.63	8.75	9.19	0.537	33.51	323.90	56.7	0.343
A2-1	641.38	1110	9.75	10.00	9.88	0.578	36.06	434.90	47.5	0.392
A2-2	642.92	1155	9.25	10.13	9.69	0.557	34.73	456.30	40.9	0.395
A2-3	526.09	990	9.50	10.00	9.75	0.531	33.16	382.80	37.4	0.387
A2-4	576.38	1100	9.00	9.75	9.38	0.524	32.70	394.60	46.1	0.359
A3-1	726.03	1270	10.13	9.75	9.94	0.572	35.67	467.60	55.3	0.368
A3-2	797.30	1310	9.75	10.00	9.88	0.609	37.98	505.70	57.7	0.386
A3-3	649.20	1200	9.75	9.50	9.63	0.541	33.76	426.70	52.1	0.356
A3-4	727.66	1215	9.50	9.50	9.50	0.599	37.37	483.10	50.6	0.398
A4-1	709.08	1275	10.25	10.88	10.57	0.556	34.70	487.80	45.4	0.383
A4-2	672.42	1265	10.63	9.63	10.13	0.532	33.17	466.60	44.1	0.369
A4-3	571.08	1090	9.63	10.13	9.88	0.524	32.69	402.50	41.9	0.369
A4-4	548.00	1050	9.63	10.25	9.94	0.522	32.57	392.90	39.5	0.374
A5-1	723.31	1330	10.63	10.88	10.76	0.544	33.94	511.90	41.3	0.385
A5-2	739.10	1310	10.50	10.50	10.50	0.564	35.21	510.80	44.7	0.390
A5-3	735.53	1295	11.00	10.25	10.63	0.568	35.44	508.70	44.6	0.393
A5-4	680.90	1220	10.13	10.63	10.38	0.558	34.83	471.20	44.5	0.386
Average					***9.93***	***0.554***	***34.54***	***436.31***	***48.7***	***0.373***
St. Dev.					***0.44***	***0.024***	***1.51***	***59.69***	***7.9***	***0.020***

Control - Green Pine

SAMPLE#	Wet Wt (gms)	VOLUME (cm^3)	INITIAL DIAMETER (in)	INITIAL DIAMETER (in)	AVERAGE DIAMETER (in)	DENSITY (gm/cm^3)	DENSITY (lbs/cu.ft)	Dry Wt. (gm)	MC% Dry Base	Specific Gravity
P1-1	421.37	710	7.50	7.50	7.50	0.593	37.03	340.50	23.8	0.480
P1-2	353.85	630	7.38	7.38	7.38	0.562	35.05	277.60	27.5	0.441
P1-3	361.20	605	7.25	7.13	7.19	0.597	37.25	282.30	27.7	0.434
P1-4	345.65	585	7.00	7.00	7.00	0.591	36.87	269.00	28.5	0.460
P2-1	480.86	755	8.00	8.50	8.25	0.637	39.74	366.70	31.1	0.486
P2-2	485.00	755	7.75	7.25	7.50	0.642	40.08	351.90	37.9	0.466
P2-3	395.35	640	7.25	7.50	7.38	0.618	38.55	296.60	33.3	0.463
P2-4	380.56	600	7.25	7.50	7.38	0.634	39.58	301.00	26.4	0.502
P3-1	389.81	660	7.50	7.50	7.50	0.591	36.85	301.40	29.3	0.457
P3-2	337.67	580	7.00	7.00	7.00	0.582	36.33	261.40	29.2	0.451
P3-3	327.30	580	6.75	6.75	6.75	0.564	35.21	257.80	27.0	0.444
P3-4	311.66	550	6.75	6.75	6.75	0.567	35.36	242.70	28.4	0.441
P4-1	443.42	675	7.75	7.00	7.38	0.657	40.99	350.40	26.5	0.519
P4-2	389.80	620	7.00	7.00	7.00	0.629	39.23	302.40	28.9	0.488
P4-3	361.51	580	7.50	6.75	7.13	0.623	38.89	288.50	25.3	0.497
P4-4	358.68	585	7.00	6.50	6.75	0.613	38.26	278.90	28.6	0.477
P5-1	276.64	485	6.25	6.50	6.38	0.570	35.59	214.70	28.8	0.443
P5-2	255.44	445	6.25	6.00	6.13	0.574	35.82	197.70	29.2	0.444
P5-3	242.24	425	6.00	6.00	6.00	0.570	35.57	193.60	25.1	0.456
P5-4	235.14	425	5.75	6.00	5.88	0.553	34.52	187.20	25.6	0.440
Average					***7.01***	***0.598***	***37.34***	***277.11***	***28.9***	***0.464***
St. Dev.					***0.59***	***0.031***	***1.94***	***52.64***	***3.7***	***0.024***

Log diameters, moisture and densities taken after stranding

(50 degree counter knife angle throughout stranding)

Vacuum- Pressure Treated MPB Wood

SAMPLE#	Wet Wt (gms)	VOLUME (cm^3)	INITIAL DIAMETER (in)	INITIAL DIAMETER (in)	AVERAGE DIAMETER (in)	DENSITY (gm/cm^3)	DENSITY (lbs/cu ft)	Dry Wt (gm)	MC% Dry Base	Specific Gravity
V1	825.78	825	9.25	8.75	9.00	1.057	65.97	301.30	174.1	0.386
V2	705.14	860	9.25	8.75	9.00	0.820	51.16	324.20	117.5	0.377
V3	762.76	855	9.25	8.80	9.03	0.892	55.67	323.80	135.6	0.379
V4	516.73	580	7.75	7.25	7.50	0.891	55.59	268.10	92.7	0.462
V5	489.92	540	7.50	7.50	7.50	1.036	64.63	251.10	95.1	0.531
V6	452.76	515	7.25	7.00	7.13	0.879	54.86	233.10	94.2	0.453
V7	457.20	505	7.00	7.00	7.00	0.905	56.49	229.40	99.3	0.454
Average					***8.02***	***0.926***	***57.77***	***275.86***	***115.5***	***0.434***
St. Dev.					***0.94***	***0.087***	***5.43***	***40.71***	***30.2***	***0.057***

Beetle Killed wood - 0 day sprinkling

SAMPLE#	Wet Wt (gms)	VOLUME (cm^3)	INITIAL DIAMETER (in)	INITIAL DIAMETER (in)	AVERAGE DIAMETER (in)	DENSITY (gm/cm^3)	DENSITY (lbs/cu ft)	Dry Wt (gm)	MC% Dry Base	Specific Gravity
1A	449.25	685	8.00	9.00	8.50	0.656	40.92	325.60	38.0	0.475
2B	546.79	1085	9.75	10.00	9.88	0.504	31.45	442.90	23.5	0.408
3C	356.34	580	8.25	8.38	8.32	0.614	38.34	282.10	26.3	0.486
4D	431.72	830	8.50	8.88	8.69	0.520	32.46	357.50	20.8	0.431
5A	613.27	1105	9.88	10.00	9.94	0.555	34.63	495.20	23.8	0.448
6B	476.08	900	8.75	9.25	9.00	0.529	33.01	369.70	28.8	0.411
7C	843.44	1200	10.50	10.38	10.44	0.703	43.86	604.70	39.5	0.504
8D	473.71	860	8.88	9.13	9.01	0.551	34.37	332.00	42.7	0.386
9A	532.37	935	9.50	9.75	9.63	0.569	35.53	403.90	31.8	0.432
10B	734.11	1180	9.63	10.13	9.88	0.622	38.82	551.70	33.1	0.468
11C	827.11	1285	10.50	10.88	10.69	0.644	40.16	590.80	40.0	0.460
12D	494.63	925	8.75	9.75	9.25	0.535	33.37	417.80	18.4	0.452
13A	937.14	1465	10.50	11.50	11.00	0.640	39.92	629.90	48.8	0.430
14B	566.87	940	9.25	10.13	9.69	0.603	37.63	452.10	25.4	0.481
15C	572.98	860	9.50	9.50	9.50	0.666	41.57	384.20	49.1	0.447
16D	585.63	910	8.75	9.00	8.88	0.644	40.16	439.00	33.4	0.482
17A	629.54	1085	9.13	10.13	9.63	0.580	36.21	522.90	20.4	0.482
18B	505.44	835	8.75	9.00	8.88	0.605	37.77	403.30	25.3	0.483
19C	666.48	1205	9.25	10.75	10.00	0.553	34.51	521.90	27.7	0.433
20D	399.22	690	8.00	8.13	8.07	0.579	36.10	336.40	18.7	0.488
Average					***9.44***	***0.594***	***37.04***	***443.18***	***30.8***	***0.454***
St. Dev.					***0.79***	***0.055***	***3.41***	***100.89***	***9.5***	***0.032***

Beetle Killed wood - 10 days sprinkling

SAMPLE#	Wet Wt (gms)	VOLUME (cm^3)	INITIAL DIAMETER (in)	INITIAL DIAMETER (in)	AVERAGE DIAMETER (in)	DENSITY (gm/cm^3)	DENSITY (lbs/cu ft)	Dry Wt (gm)	MC% Dry Base	Specific Gravity
1B	493.16	705	8.00	8.50	8.25	0.700	43.65	323.70	52.4	0.459
2C	566.11	940	9.50	9.75	9.63	0.602	37.58	383.80	47.5	0.408
3D	415.69	640	8.25	8.25	8.25	0.650	40.53	313.10	32.8	0.489
4A	579.60	940	9.25	8.75	9.00	0.617	38.48	416.30	39.2	0.443
5B	671.88	1045	9.50	10.50	10.00	0.643	40.12	451.80	48.7	0.432
6C	545.69	870	8.75	9.13	8.94	0.627	39.14	374.20	45.8	0.430
7D	805.50	985	10.50	10.50	10.50	0.818	51.03	480.50	67.6	0.488
8A	679.44	935	9.50	9.75	9.63	0.727	45.34	430.10	58.0	0.460
9B	558.27	900	9.25	9.50	9.38	0.620	38.71	373.40	49.5	0.415
10C	706.83	990	9.75	10.13	9.94	0.714	44.55	476.60	48.3	0.481
11D	896.79	1195	10.50	10.75	10.63	0.750	46.83	545.00	64.5	0.456
12A	614.91	1080	9.00	10.50	9.75	0.569	35.53	462.80	32.9	0.429
13A	1032.19	1340	11.25	12.00	11.63	0.770	48.07	610.80	69.0	0.456
14C	624.02	905	9.75	9.50	9.63	0.690	43.03	414.40	50.6	0.458
15D	695.78	935	9.25	9.25	9.25	0.744	46.43	383.70	81.3	0.410
16A	576.68	850	9.13	8.75	8.94	0.678	42.34	403.80	42.8	0.475
17B	662.75	1070	9.63	10.00	9.81	0.619	38.65	495.50	33.8	0.463
18C	500.37	795	9.00	8.75	8.88	0.629	39.27	355.90	40.6	0.448
19D	673.40	1105	9.75	10.50	10.13	0.609	38.03	472.20	42.6	0.427
20A	419.88	670	7.75	8.25	8.00	0.627	39.11	320.70	30.9	0.479
Average					***9.51***	***0.670***	***41.82***	***424.42***	***48.9***	***0.450***
St. Dev.					***0.87***	***0.066***	***4.13***	***76.69***	***13.5***	***0.025***

Log diameters, moisture and densities taken after stranding

(50 degree counter knife angle throughout stranding)

Beetle Killed wood - 20 days sprinkling

SAMPLE#	Wet Wt (gms)	VOLUME (cm^3)	INITIAL DIAMETER (in)	INITIAL DIAMETER (in)	AVERAGE DIAMETER (in)	DENSITY (gm/cm^3)	DENSITY (lbs/cu.ft)	Dry Wt. (gm)	MC% Dry Base	Specific Gravity
1C	505.79	690	7.88	8.25	8.07	0.733	45.74	312.90	61.6	0.453
2D	592.53	940	9.50	9.75	9.63	0.630	39.33	373.30	58.7	0.397
3A	565.77	730	8.75	9.00	8.88	0.775	48.36	343.20	64.9	0.470
4B	564.60	865	8.75	9.00	8.88	0.653	40.73	357.70	57.8	0.414
5C	717.35	1060	9.75	10.63	10.19	0.677	42.23	476.80	50.5	0.450
6D	565.95	830	8.75	9.50	9.13	0.682	42.55	363.80	55.6	0.438
7A	939.72	1160	10.25	11.00	10.63	0.810	50.55	577.00	62.9	0.497
8B	676.09	930	9.50	9.63	9.57	0.727	45.36	340.10	98.8	0.366
9C	633.34	945	9.00	9.50	9.25	0.670	41.82	392.60	61.3	0.415
10D	721.94	975	9.50	9.50	9.50	0.740	46.20	478.90	50.7	0.491
11A	945.04	1255	10.75	11.00	10.88	0.753	46.99	566.60	66.8	0.451
12B	582.32	955	9.00	10.50	9.75	0.610	38.05	428.50	35.9	0.449
13C	1044.18	1395	10.75	12.00	11.38	0.749	46.71	637.20	63.9	0.457
14D	688.34	940	9.50	9.75	9.63	0.732	45.69	447.30	53.9	0.476
15A	741.50	970	9.50	9.75	9.63	0.764	47.70	408.50	81.5	0.421
16B	575.09	810	9.00	8.75	8.88	0.710	44.30	371.10	55.0	0.458
17C	670.38	975	9.50	10.00	9.75	0.688	42.90	445.60	50.4	0.457
18D	495.15	765	8.25	8.75	8.50	0.647	40.39	354.40	39.7	0.463
19C	776.56	1195	11.38	10.13	10.76	0.650	40.55	432.30	79.6	0.362
20B	428.69	680	7.75	8.25	8.00	0.630	39.34	314.40	36.4	0.462
Average					*9.54*	*0.703*	*43.78*	*421.11*	*59.3*	*0.442*
St. Dev.					*0.90*	*0.056*	*3.47*	*89.83*	*15.1*	*0.037*

Beetle Killed wood - 30 days sprinkling

SAMPLE#	Wet Wt (gms)	VOLUME (cm^3)	INITIAL DIAMETER (in)	INITIAL DIAMETER (in)	AVERAGE DIAMETER (in)	DENSITY (gm/cm^3)	DENSITY (lbs/cu.ft)	Dry Wt. (gm)	MC% Dry Base	Specific Gravity
1D	509.71	660	8.00	7.75	7.88	0.772	48.19	297.20	71.5	0.450
2A	668.21	990	9.75	10.00	9.88	0.675	42.12	398.50	67.7	0.403
3B	405.00	540	9.00	8.50	8.75	0.750	46.80	255.80	58.3	0.474
4C	516.10	800	9.00	8.50	8.75	0.645	40.26	338.30	52.6	0.423
5D	707.66	1070	10.50	9.75	10.13	0.661	41.27	442.60	59.9	0.414
6A	550.00	845	9.25	8.75	9.00	0.651	40.62	354.70	55.1	0.420
7B	935.00	1145	10.75	10.50	10.63	0.817	50.96	545.40	71.4	0.476
8C	620.00	870	9.00	8.75	8.88	0.713	44.47	323.30	91.8	0.372
9D	590.00	850	9.13	8.50	8.82	0.694	43.31	339.70	73.7	0.400
10A	727.26	1040	10.00	9.75	9.88	0.699	43.64	506.20	43.7	0.487
11B	929.31	1205	11.00	10.75	10.88	0.771	48.12	555.70	67.2	0.461
12C	618.15	975	10.25	8.75	9.50	0.634	39.56	440.00	40.5	0.451
13D	966.63	1315	11.25	10.25	10.75	0.735	45.87	585.80	65.0	0.445
14A	793.77	1025	10.50	9.50	10.00	0.774	48.32	471.70	68.3	0.460
15B	660.84	830	9.50	9.50	9.50	0.796	49.68	344.20	92.0	0.415
16C	525.00	695	8.88	8.75	8.82	0.755	47.14	331.90	58.2	0.478
17D	707.59	990	9.75	9.00	9.38	0.715	44.60	500.60	41.3	0.505
18A	563.96	820	9.25	8.75	9.00	0.688	42.92	380.90	48.1	0.465
19B	745.00	1145	11.00	9.50	10.25	0.651	40.60	474.40	57.0	0.414
20C	458.91	700	8.13	8.00	8.07	0.656	40.91	325.60	40.9	0.465
Average					*9.43*	*0.713*	*44.47*	*410.63*	*61.2*	*0.444*
St. Dev.					*0.85*	*0.056*	*3.48*	*95.57*	*15.0*	*0.035*

Moisture Gradient after Stranding

Green Aspen

Log#	Green wt	Dry Wt	%MC
A1-1			
1	21.56	11.35	89.96
2	19.68	10.97	80.14
3	15.85	10.19	55.54
4	16.61	11.90	39.58
5	15.93	11.70	36.23
6	15.46	10.50	47.24
7	20.87	11.77	77.32
8	21.09	11.27	87.13
A1-2			
1	23.89	11.48	108.01
2	18.79	10.34	62.38
3	18.42	11.90	54.79
4	16.77	10.91	53.71
5	15.25	11.23	35.80
6	16.39	10.73	52.75
7	18.37	11.35	61.85
8	24.61	12.40	98.47
A1-3			
1	25.70	14.94	72.42
2	20.96	12.41	68.90
3	17.86	11.53	54.90
4	13.27	8.94	48.43
5	16.23	12.45	30.36
6	14.39	9.56	50.52
7	19.43	11.94	62.73
8	16.47	9.60	71.56
A1-4			
1	21.99	11.56	90.14
2	18.36	10.50	74.86
3	17.07	11.01	55.04
4	24.02	16.49	45.75
5	15.84	11.67	35.73
6	18.81	12.76	47.57
7	20.29	12.56	61.54
8	20.15	11.50	75.22
A2-1			
1	18.96	12.29	54.27
2	18.70	12.59	49.01
3	16.99	12.53	35.59
4	27.60	20.69	33.40
5	17.17	13.36	28.52
6	16.11	11.97	34.59
7	17.80	12.33	44.36
8	19.33	12.83	50.66
A2-2			
1	16.07	12.28	30.86
2	17.14	13.28	29.07
3	16.50	14.71	25.76
4	20.03	16.36	22.43
5	15.72	12.59	24.86
6	16.74	14.83	26.37
7	17.56	13.49	30.17
A2-3			
1	20.79	12.15	71.11
2	19.64	12.46	57.62
3	16.20	12.55	29.08
4	14.65	12.40	18.15
5	20.58	17.90	18.12
6	15.91	12.46	27.69
7	18.64	11.84	40.54
8	18.97	11.59	63.68

Log#	Green wt	Dry Wt	%MC
A2-4			
1	20.68	12.45	66.10
2	19.83	12.33	60.83
3	20.00	14.03	42.55
4	18.81	14.04	33.97
5	18.30	13.94	31.28
6	19.57	13.74	42.43
7	18.06	12.40	45.65
8	22.27	13.64	63.27
A3-1			
1	22.16	11.82	87.48
2	19.66	11.20	75.54
3	18.65	11.44	63.02
4	21.48	16.72	28.47
5	14.20	11.16	27.24
6	16.10	11.58	39.03
7	21.41	12.37	73.08
8	21.03	11.66	80.36
A3-2			
1	25.53	12.12	110.64
2	22.67	11.84	91.47
3	20.42	12.12	68.48
4	23.78	16.94	40.38
5	17.12	13.92	22.99
6	18.88	13.00	45.23
7	23.32	12.82	81.90
8	23.37	11.59	101.64
A3-3			
1	22.62	11.60	95.00
2	21.47	12.05	78.17
3	19.53	11.69	67.07
4	31.02	22.86	35.70
5	15.75	12.10	30.17
6	19.22	13.13	46.38
7	23.91	13.47	77.51
8	23.52	12.32	90.91
A3-4			
1	25.22	12.58	100.48
2	24.25	12.70	90.94
3	21.52	13.10	64.27
4	17.40	12.98	34.05
5	22.09	18.82	17.38
6	17.48	12.62	38.51
7	23.66	13.69	72.83
8	24.34	12.48	95.03
A4-1			
1	21.54	12.78	68.54
2	18.93	11.86	59.61
3	19.52	13.52	44.38
4	18.20	13.71	32.75
5	22.31	17.40	28.22
6	15.35	11.89	29.10
7	17.97	12.60	42.62
8	19.11	12.45	53.49
9	20.63	12.31	67.59
A4-2			
1	18.36	11.91	54.16
2	20.18	11.97	68.59
3	19.03	12.86	47.98
4	16.09	12.35	30.28
5	18.30	13.34	37.18
6	18.61	12.21	52.42
7	17.69	13.03	35.76
8	18.78	12.64	48.58
9	18.14	12.13	49.55

Log#	Green wt	Dry Wt	%MC
A4-3			
1	19.26	11.94	61.31
2	18.25	12.12	50.58
3	16.66	11.51	44.74
4	17.16	13.34	28.64
5	14.33	11.49	24.72
6	14.81	11.52	28.56
7	19.49	13.49	44.48
8	19.37	13.08	48.09
9	17.85	11.66	53.09
A4-4			
1	20.03	11.86	68.89
2	17.79	12.12	46.78
3	16.61	12.58	32.03
4	14.42	11.71	23.14
5	11.34	9.32	21.67
6	17.19	13.43	28.00
7	18.35	12.69	44.60
8	21.02	12.68	65.77
A5-1			
1	21.88	12.41	76.31
2	20.25	13.74	47.38
3	16.68	11.49	45.17
4	18.84	14.06	34.00
5	15.09	12.20	23.69
6	22.92	17.11	33.96
7	18.67	12.97	43.95
8	17.26	11.81	46.15
9	19.03	12.50	52.24
A5-2			
1	22.64	13.24	71.00
2	17.41	11.93	45.93
3	16.87	11.88	42.00
4	17.61	13.03	35.15
5	16.88	13.48	25.22
6	17.65	13.58	29.97
7	19.40	13.71	41.50
8	17.68	12.22	44.68
9	21.25	13.67	55.45
A5-3			
1	20.75	13.54	53.25
2	17.83	11.94	49.33
3	19.42	13.09	48.36
4	18.44	13.36	38.02
5	16.96	13.11	29.37
6	23.81	18.15	31.18
7	18.85	13.45	40.15
8	18.37	12.31	49.23
9	19.52	13.02	49.92
A5-4			
1	24.29	14.51	67.40
2	20.80	13.58	53.17
3	19.71	13.47	46.33
4	19.18	13.97	37.29
5	16.73	12.96	29.09
6	18.48	13.59	35.98
7	18.24	13.10	39.24
8	18.04	12.26	47.15
9	19.94	12.46	60.03

Moisture Gradient after Stranding

Green Pine

Log#	Green wt	Dry Wt	%MC
P1-1			
1	19.01	14.68	29.50
2	17.25	13.65	26.37
3	17.14	14.41	18.95
4	18.39	15.82	16.25
5	6.37	5.40	17.96
6	18.43	15.22	21.09
7	19.29	15.19	26.99
P1-2			
1	17.10	13.20	29.55
2	19.52	15.31	27.50
3	19.75	15.79	25.08
4	19.56	15.95	22.63
5	26.42	21.37	23.63
6	18.56	14.57	27.39
7	17.34	13.46	28.83
P1-3			
1	17.22	13.13	31.15
2	18.83	14.86	26.72
3	18.04	14.68	22.89
4	20.88	17.28	20.83
5	17.79	14.44	23.20
6	19.41	15.26	27.20
P1-4			
1	18.59	14.35	29.55
2	18.88	14.93	26.46
3	17.86	14.26	25.25
4	16.62	13.38	24.22
5	18.84	15.03	25.35
6	17.47	13.70	27.52
P2-1			
1	18.20	13.92	30.75
2	18.02	14.07	28.07
3	18.15	14.80	22.64
4	17.00	14.55	16.84
5	16.86	13.83	21.91
6	18.13	14.25	27.23
7	5.93	4.62	28.35
P2-2			
1	16.07	12.28	30.86
2	17.14	13.28	29.07
3	18.50	14.71	25.76
4	20.03	16.36	22.43
5	15.72	12.59	24.86
6	18.74	14.83	26.37
7	17.56	13.49	30.17
P2-3			
1	15.29	11.77	29.91
2	18.25	14.37	27.00
3	17.49	14.07	24.31
4	16.90	13.83	22.20
5	26.53	21.22	25.02
6	15.89	12.38	28.35

Log#	Green wt	Dry Wt	%MC
P2-4			
1	16.86	13.26	27.14932
2	17.28	13.91	24.23
3	19.98	16.43	21.61
4	16.53	13.69	20.75
5	19.15	15.46	23.87
6	17.70	14.05	25.98
P3-1			
1	17.95	13.96	28.58
2	17.74	13.91	27.53
3	17.86	14.30	24.90
4	17.24	14.03	22.88
5	17.82	14.24	25.14
6	20.14	15.79	27.55
P3-2			
1	18.42	14.61	26.08
2	19.30	15.59	23.80
3	23.20	18.95	22.43
4	16.51	13.64	21.04
5	17.16	14.01	22.48
6	18.55	14.84	25.00
P3-3			
1	16.78	13.27	26.45
2	19.70	15.82	24.53
3	17.99	14.67	22.63
4	15.90	13.09	21.47
5	19.47	15.72	23.85
6	18.08	14.44	25.21
P3-4			
1	16.01	12.62	26.86
2	17.31	13.92	24.35
3	18.28	14.79	23.60
4	15.45	12.57	22.91
5	17.99	14.52	23.90
6	18.84	15.04	25.27
P4-1			
1	18.05	13.96	29.30
2	22.68	18.01	25.93
3	20.38	16.71	21.96
4	16.79	14.11	18.99
5	19.42	15.70	23.69
6	16.22	12.75	27.22
P4-2			
1	18.64	14.26	30.72
2	25.20	20.10	25.37
3	20.21	16.59	21.82
4	20.90	17.42	19.98
5	21.76	17.37	25.27
6	19.92	15.52	28.35

Log#	Green wt	Dry Wt	%MC
P4-3			
1	15.49	12.19	27.07
2	19.57	15.86	23.39
3	17.41	14.29	21.83
4	17.66	14.83	19.06
5	17.98	14.96	20.19
6	18.20	14.78	23.14
7	17.55	13.88	26.44
P4-4			
1	16.76	13.19	27.07
2	18.27	14.64	24.80
3	20.36	16.45	23.77
4	16.57	13.58	22.02
5	22.86	18.43	24.04
6	16.92	13.33	26.93
P5-1			
1	13.47	10.81	24.61
2	17.74	14.29	24.14
3	16.62	13.63	21.94
4	16.38	13.45	21.78
5	17.73	14.47	22.53
6	17.13	13.77	24.40
P5-2			
1	17.16	12.78	34.27
2	17.69	14.46	22.34
3	17.73	14.86	19.31
4	8.58	7.23	18.67
5	16.85	13.90	21.22
6	17.26	14.05	22.85
P5-3			
1	8.49	6.87	23.58
2	10.63	8.70	22.18
3	15.28	12.55	21.75
4	16.12	13.43	20.03
5	14.54	11.92	21.98
6	14.61	11.87	23.08
P5-4			
1	18.08	14.58	24.01
2	17.37	14.23	22.07
3	23.70	19.72	20.18
4	16.31	13.45	21.26
5	17.56	14.33	22.54

Moisture Gradient after Stranding

0 Day Spinning MPB Logs

Log#	Green wt	Dry Wt	%MC		
1A				outer avg	37.97
1	17.65	12.36	42.80	inner avg	34.78
2	18.11	13.04	38.91		
3	16.65	13.89	20.04		
4	13.31	10.15	31.27		
5	16.61	13.89	19.58		
6	16.93	14.06	20.41		
7	14.12	14.36	13.35		
2B				outer avg	55.47
1	9.24	7.72	20.34	inner avg	50.76
2	14.66	11.76	55.28		
3	13.64	11.80	44.03		
4	14.15	12.25	45.51		
5	13.78	12.00	14.83		
6	13.78	11.89	15.90		
7	15.35	13.23	16.02		
8	14.13	12.29	14.95		
3C				outer avg	24.36
1	15.02	12.02	24.96	inner avg	19.68
2	14.45	11.73	23.19		
3	11.45	9.61	19.15		
4	15.60	13.30	17.29		
5	14.67	12.33	18.98		
6	22.62	18.88	19.81		
7	19.69	15.91	23.76		
4D				outer avg	27.20
1	19.05	14.65	30.03	inner avg	14.97
2	15.22	13.07	16.45		
3	14.63	12.70	15.20		
4	14.48	12.68	14.21		
5	15.06	13.20	14.09		
6	15.41	13.48	14.32		
7	15.27	13.21	15.59		
8	13.69	11.05	24.36		
5A				outer avg	28.36
1	14.52	11.22	29.41	inner avg	15.64
2	13.96	11.06	16.99		
3	13.91	12.03	15.63		
4	13.56	11.77	15.28		
5	16.93	14.82	14.24		
6	15.63	13.57	15.16		
7	14.60	12.65	15.42		
8	14.03	12.03	16.63		
9	15.43	12.12	27.35		
6B				outer avg	22.57
1	22.38	18.42	21.50	inner avg	19.69
2	13.70	11.31	21.13		
3	15.33	12.75	20.24		
4	17.63	14.85	18.72		
5	13.93	11.50	21.13		
6	15.40	13.10	17.56		
7	13.79	11.55	19.39		
8	16.85	13.74	22.63		
7C				outer avg	48.90
1	17.06	14.28	19.47	inner avg	20.29
2	16.09	13.19	21.99		
3	16.62	13.24	25.53		
4	17.97	15.32	17.30		
5	18.29	15.54	17.70		
6	16.48	13.90	18.56		
7	16.32	13.73	18.86		
8	16.35	13.39	22.11		
9	15.39	8.63	78.33		

Log#	Green wt	Dry Wt	%MC		
8D				outer avg	47.73
1	17.17	13.40	28.13	inner avg	20.80
2	14.37	11.96	20.25		
3	12.17	9.93	22.58		
4	13.04	10.77	21.08		
5	11.82	11.73	18.87		
6	12.39	10.25	21.47		
7	16.27	13.54	20.43		
8	17.72	10.59	67.33		
9A				outer avg	39.23
1	25.90	18.33	58.91	inner avg	13.46
2	16.01	11.81	19.64		
3	17.24	14.14	21.92		
4	17.32	14.71	17.26		
5	15.94	13.13	20.65		
6	15.69	13.14	19.04		
7	15.73	13.12	17.87		
8	14.96	12.71	17.52		
10B				outer avg	22.91
1	18.87	15.59	21.06	inner avg	26.71
2	20.14	16.18	24.80		
3	21.98	18.50	18.83		
4	18.29	14.74	24.08		
5	19.01	15.75	20.70		
6	17.64	14.16	24.59		
7	23.68	16.12	46.94		
8	17.21	13.86	24.14		
11C				outer avg	56.18
1	24.02	14.49	65.77	inner avg	24.02
2	16.33	13.23	23.43		
3	16.75	13.46	24.44		
4	20.33	15.94	27.54		
5	16.86	13.52	24.75		
6	19.03	15.51	22.70		
7	17.55	14.19	23.68		
8	18.65	15.04	24.27		
9	18.65	14.96	24.83		
10	9.25	6.19	49.59		
12D				outer avg	51.32
1	18.37	16.25	13.40	inner avg	11.12
2	16.15	14.11	14.40		
3	14.88	12.75	16.61		
4	14.34	12.43	15.37		
5	14.49	12.62	14.74		
6	16.23	14.16	14.62		
7	15.49	13.55	14.32		
8	15.71	13.40	17.24		
13A				outer avg	56.45
1	15.76	9.75	61.64	inner avg	25.33
2	16.54	13.65	21.17		
3	14.13	11.13	26.95		
4	14.73	11.78	25.04		
5	15.68	12.23	28.21		
6	14.45	11.36	27.20		
7	15.96	12.64	26.27		
8	17.29	13.59	27.23		
9	16.55	13.36	23.88		
10	17.26	14.14	22.07		
11	16.17	10.65	51.26		
14C				outer avg	33.97
1	16.81	14.15	18.86	inner avg	20.31
2	17.40	14.67	18.63		
3	14.71	12.16	20.77		
4	15.60	12.72	22.64		
5	16.67	14.06	18.56		
6	16.96	14.19	19.52		
7	19.66	13.81	42.36		

Log#	Green wt	Dry Wt	%MC		
15C				outer avg	
1	13.67	8.90	53.62	inner avg	
2	14.92	12.44	19.94		
3	16.10	13.43	23.23		
4	15.59	12.72	22.56		
5	16.81	13.22	27.19		
6	16.25	13.33	21.91		
7	16.51	13.08	22.40		
8	15.15	11.94	26.91		
9	15.78	9.97	140.71		
16D				outer avg	
1	23.90	23.90	31.17	inner avg	
2	19.56	12.74	22.54		
3	25.27	21.31	18.36		
4	23.78	17.56	21.44		
5	19.54	16.34	19.58		
6	19.42	16.11	20.55		
7	23.51	19.42	24.01		
8	24.82	21.72	18.75		
9	18.95	15.66	24.01		
17A				outer avg	
1	18.44	11.98	20.51	inner avg	
2	19.39	16.84	15.08		
3	15.34	13.21	16.21		
4	17.13	15.15	13.71		
5	16.91	14.61	15.58		
6	15.85	13.21	17.05		
7	16.62	14.05	14.23		
8	18.64	12.45	17.59		
9	15.35	13.22	16.13		
18B				outer avg	
1	12.21	10.11	18.74	inner avg	
2	19.62	17.04	15.14		
3	16.65	14.46	15.15		
4	18.03	15.51	16.23		
5	16.96	14.58	16.32		
6	19.96	17.45	14.50		
7	17.35	15.08	15.06		
8	21.21	16.45	28.89		
19C				outer avg	
1	13.85	11.81	17.31	inner avg	
2	13.96	11.56	20.75		
3	14.11	11.99	17.68		
4	11.81	11.32	22.00		
5	13.51	10.89	23.97		
6	19.21	15.71	22.22		
7	13.16	10.75	22.39		
8	14.48	11.91	21.58		
9	19.78	16.10	22.86		
20D				outer avg	
1	23.66	23.34	16.32	inner avg	
2	15.48	14.28	14.61		
3	18.67	16.58	13.81		
4	16.15	13.99	15.51		
5	16.57	14.53	14.73		
6	15.53	13.45	15.49		
7	16.44	14.10	14.97		

Moisture Gradient after Stranding

10 Day Sprinkling MPB Logs

Log#	Green wt	Dry Wt	%MC	outer avg.	inner avg.
1B					
1	17.08	13.21	29.34		
2	17.19	13.65	25.93		
3	16.18	12.95	24.91		
4	15.42	12.66	21.80		
5	16.53	13.70	20.66		
6	14.83	12.52	18.47		
7	15.08	13.03	15.67		
2C					
1	17.94	9.80	91.65		
2	13.58	11.35	20.05		
3	15.87	12.21	29.98		
4	14.80	12.81	15.57		
5	13.28	11.02	20.51		
6	13.35	11.19	19.31		
7	12.93	10.56	18.84		
8	12.84	10.47	19.82		
9	13.01	8.38	55.42		
3D					
1	12.72	8.82	82.27		
2	17.27	14.35	20.35		
3	16.81	15.84	16.45		
4	16.48	13.27	18.27		
5	17.69	14.90	17.95		
6	17.13	14.52	18.00		
7	16.48	14.01	17.66		
8	11.91	2.048	38.77		
4A					
1	20.88	16.78	42.61		
2	18.12	13.93	43.56		
3	18.02	13.53	19.67		
4	18.61	15.19	19.96		
5	16.13	13.77	17.28		
6	15.45	13.40	15.24		
7	15.88	13.81	16.30		
8	17.88	12.71	40.68		
5B					
1	16.11	12.12	76.21		
2	11.83	9.70	21.96		
3	14.35	12.08	19.52		
4	13.63	11.54	18.13		
5	11.65	9.68	18.19		
6	12.51	10.28	17.23		
7	13.58	11.47	18.12		
8	11.52	9.62	17.31		
9	18.74	13.71	47.27		
6A					
1	20.77	16.11	47.62		
2	13.82	11.27	22.63		
3	14.36	11.91	20.57		
4	13.88	11.40	20.91		
5	14.93	12.39	20.50		
6	15.11	12.39	22.00		
7	18.21	13.19	45.64		
8	23.65	17.11	112.82		
7D					
1	32.71	25.27	29.44		
2	17.81	14.89	20.06		
3	19.47	16.28	19.61		
4	25.79	17.27	20.38		
5	16.57	13.53	27.17		
6	15.69	13.60	24.21		
7	15.14	12.47	23.83		
8	29.96	12.93	131.71		
9	27.12	11.38	144.21		

Log#	Green wt	Dry Wt	%MC	outer avg.	inner avg.
8A					
1	22.08	8.84	252.32		
2	15.81	12.80	25.89		
3	14.27	11.58	25.79		
4	18.61	11.63	26.37		
5	13.83	10.94	24.80		
6	14.45	11.34	27.38		
7	21.35	11.86	80.01		
8	23.46	8.69	169.62		
9B					
1	40.70	21.40	90.09		
2	14.80	11.92	24.20		
3	15.18	12.33	23.04		
4	14.58	12.04	23.67		
5	15.05	11.91	25.68		
6	15.18	12.63	23.74		
7	14.58	12.18	19.71		
9C					
1	15.82	14.10	11.51		
2	15.98	12.91	24.15		
3	16.37	13.12	22.90		
4	15.60	12.51	23.79		
5	20.70	16.68	49.71		
6	17.54	13.85	26.29		
7	14.98	11.76	25.73		
8	15.82	13.02	26.11		
9	22.71	16.86	55.67		
9D					
1	23.61	14.83	63.36		
2	16.12	12.98	26.71		
3	15.63	12.48	25.47		
4	15.27	12.12	25.98		
5	16.71	13.11	27.52		
6	16.23	12.87	26.14		
7	15.68	12.47	25.80		
8	19.58	15.38	27.31		
10A					
1	27.55	20.81	32.39		
2	15.31	12.68	20.74		
3	16.72	13.46	17.66		
4	15.91	12.81	17.17		
5	14.59	12.40	17.72		
6	16.81	14.19	18.50		
7	16.48	13.15	22.82		
8	14.48	12.09	17.96		
9	18.71	12.94	44.27		
10B					
1	27.65	18.91	98.84		
2	16.04	12.93	24.06		
3	15.32	12.11	26.51		
4	15.85	12.61	25.67		
5	14.72	11.91	30.15		
6	16.51	13.46	23.21		
7	18.59	14.72	26.29		
8	18.01	14.11	27.64		
9	20.89	13.52	53.53		
10	24.51	11.73	109.12		
10C					
1	19.81	14.15	39.98		
2	17.40	14.47	19.91		
3	18.71	12.19	23.21		
4	15.80	12.72	22.44		
5	16.47	14.08	16.95		
6	16.96	14.19	19.52		
7	19.66	15.81	42.36		

Log#	Green wt	Dry Wt	%MC	outer avg.	inner avg.
10D					
1	47.01	17.92	128.85		
2	19.56	11.51	35.19		
3	15.53	12.51	24.14		
4	16.78	12.82	23.09		
5	16.76	13.43	24.80		
6	15.43	13.27	23.91		
7	15.24	12.35	23.40		
8	21.48	13.54	58.64		
11A					
1	19.43	15.29	27.08		
2	19.28	15.86	21.56		
3	18.75	15.23	23.11		
4	21.36	16.19	44.29		
5	16.88	13.69	23.30		
6	17.09	13.95	22.51		
7	16.75	12.75	23.53		
8	17.97	11.54	55.72		
11B					
1	17.55	13.62	28.85		
2	17.76	15.09	17.69		
3	16.68	14.23	17.22		
4	15.16	12.81	18.35		
5	14.43	12.24	17.89		
6	15.36	12.63	21.62		
7	14.37	12.17	18.08		
8	15.39	13.09	17.57		
9	20.12	15.14	32.89		
11C					
1	19.70	14.31	37.67		
2	17.72	14.91	18.85		
3	18.12	15.40	17.66		
4	17.66	14.86	18.84		
5	16.87	14.11	19.56		
6	16.14	13.68	17.98		
7	15.20	12.88	18.01		
8	16.99	11.52	47.48		
12D					
1	17.27	10.16	69.98		
2	14.29	11.46	24.69		
3	14.62	11.86	23.27		
4	14.34	11.60	23.62		
5	14.63	11.70	25.04		
6	15.84	12.74	24.33		
7	15.62	12.52	24.76		
8	24.56	16.59	48.04		
13A					
1	16.51	12.18	35.55		
2	16.42	14.24	15.31		
3	14.67	12.43	18.02		
4	16.92	14.47	16.93		
5	14.63	12.55	16.57		
6	14.72	12.56	17.20		
7	19.49	15.20	28.22		

Moisture Gradient after Stranding

20 Day Spinking MPB Logs

Log#	Green wt	Dry Wt	%MC		
1C				outer avg.	69.57
1	20.20	10.23	97.46	inner avg.	23.62
2	15.45	12.74	21.27		
3	16.84	13.49	24.83		
4	14.39	11.61	23.86		
5	14.84	12.34	20.26		
6	14.67	11.47	27.90		
7	22.88	16.15	41.67		
2D				outer avg.	71.29
1	28.35	16.31	73.82	inner avg.	21.33
2	13.44	11.14	20.65		
3	13.24	11.12	19.06		
4	14.07	11.78	19.44		
5	13.17	10.60	24.25		
6	13.78	11.40	20.88		
7	12.74	10.30	23.69		
8	17.94	10.63	68.77		
3A				outer avg.	64.13
1	21.81	12.26	77.90	inner avg.	51.04
2	14.99	12.24	22.47		
3	15.50	12.19	27.15		
4	15.57	12.41	25.46		
5	15.34	11.70	31.11		
6	20.04	11.48	74.56		
7	20.43	9.06	125.50		
8	29.38	19.54	50.36		
4B				outer avg.	74.61
1	32.99	17.17	92.14	inner avg.	23.50
2	13.44	11.34	18.52		
3	13.92	11.05	25.97		
4	14.14	11.43	23.71		
5	13.89	11.32	22.70		
6	14.22	11.75	21.02		
7	14.11	10.93	29.09		
8	16.43	10.46	57.07		
5C				outer avg.	79.26
1	18.90	10.28	83.85	inner avg.	24.91
2	12.06	10.25	17.66		
3	13.22	11.27	17.30		
4	14.28	11.86	20.40		
5	11.67	9.65	20.93		
6	11.52	9.63	19.63		
7	12.65	10.69	18.33		
8	27.71	17.31	60.08		
9	19.23	11.01	74.66		
6D				outer avg.	48.12
1	16.83	10.79	55.98	inner avg.	24.71
2	15.93	12.72	25.24		
3	14.70	11.94	23.12		
4	13.59	10.59	28.33		
5	14.29	11.55	23.72		
6	12.13	9.81	23.65		
7	13.14	10.58	24.20		
8	15.71	11.20	40.27		
7A				outer avg.	75.66
1	22.06	15.66	40.87	inner avg.	31.63
2	19.49	15.84	23.04		
3	14.65	11.80	24.15		
4	15.78	12.88	22.52		
5	17.11	14.16	20.83		
6	16.44	13.46	22.14		
7	22.79	12.87	77.08		
8	24.16	11.48	110.45		

Log#	Green wt	Dry Wt	%MC		
8B				outer avg.	175.33
1	33.56	13.59	147.09	inner avg.	34.26
2	13.73	10.78	27.37		
3	13.07	10.23	27.76		
4	13.29	10.37	28.16		
5	14.68	11.49	27.76		
6	20.62	12.26	68.19		
7	14.72	11.65	26.35		
8	25.47	8.39	203.58		
9C				outer avg.	98.17
1	28.02	18.58	50.81	inner avg.	22.31
2	14.57	12.10	20.41		
3	13.04	10.61	22.90		
4	14.38	11.91	20.74		
5	13.75	11.37	20.93		
6	14.13	11.19	26.27		
7	14.16	11.55	22.60		
8	22.00	8.96	145.54		
10D				outer avg.	50.42
1	17.34	12.28	41.21	inner avg.	27.79
2	22.14	15.56	42.11		
3	14.16	11.30	25.31		
4	17.68	14.07	25.66		
5	20.18	16.04	25.81		
6	15.84	12.32	28.57		
7	15.56	12.71	22.42		
8	18.89	15.15	24.69		
9	22.22	13.92	59.63		
11A				outer avg.	106.89
1	20.10	9.94	102.21	inner avg.	35.88
2	21.46	13.01	64.95		
3	15.16	12.10	25.29		
4	13.79	10.93	26.17		
5	15.38	12.02	27.95		
6	15.64	12.55	24.62		
7	14.36	11.41	25.85		
8	14.79	11.53	28.19		
9	20.67	12.60	64.05		
10	25.77	12.18	111.58		
12B				outer avg.	57.41
1	27.66	17.84	55.04	inner avg.	21.48
2	14.85	12.31	20.63		
3	13.75	11.30	21.68		
4	14.42	12.00	20.17		
5	15.61	13.08	19.34		
6	14.61	12.29	18.88		
7	15.67	12.37	26.68		
8	14.02	11.40	22.98		
9	16.25	10.17	59.78		
13C				outer avg.	94.45
1	18.46	11.59	59.28	inner avg.	44.71
2	15.19	11.95	27.11		
3	14.46	11.26	28.60		
4	14.63	11.68	26.97		
5	14.87	11.56	28.63		
6	14.62	11.30	29.38		
7	10.77	8.32	29.45		
8	16.05	6.61	142.81		
9	14.88	6.48	129.63		
14D				outer avg.	61.63
1	33.40	18.60	79.57	inner avg.	22.11
2	17.09	14.43	18.43		
3	17.60	14.20	23.94		
4	15.08	12.24	23.20		
5	14.76	12.32	19.81		
6	16.23	13.29	22.12		
7	15.81	12.63	25.18		
8	20.26	11.03	83.68		

Log#	Green wt	Dry Wt	%MC	
15A				outer avg.
1	24.29	10.58	129.58	inner avg.
2	14.21	11.58	22.71	
3	22.37	11.35	97.09	
4	14.77	11.79	25.28	
5	14.01	11.38	23.11	
6	14.44	11.26	28.01	
7	20.52	12.61	61.70	
8	15.92	12.98	23.03	
9	11.83	5.43	117.86	
16B				outer avg.
1	14.74	9.25	59.35	inner avg.
2	18.89	13.13	43.87	
3	17.28	13.56	27.43	
4	14.67	11.56	26.88	
5	14.79	11.75	25.87	
6	15.32	11.96	28.09	
7	17.54	13.35	30.99	
8	22.60	12.14	86.16	
17C				outer avg.
1	18.95	9.89	91.80	inner avg.
2	14.48	11.98	20.87	
3	14.01	11.71	19.64	
4	20.89	14.79	41.53	
5	17.32	14.44	19.94	
6	13.94	11.37	22.60	
7	13.10	10.81	20.96	
8	16.05	13.40	18.98	
9	15.83	8.02	97.38	
18D				outer avg.
1	15.95	10.49	52.15	inner avg.
2	17.30	14.25	21.40	
3	15.58	12.92	20.43	
4	15.27	12.82	19.19	
5	16.23	13.77	18.16	
6	16.37	13.80	18.62	
7	16.59	13.92	19.16	
8	18.30	12.61	52.12	
19C				outer avg.
1	22.25	15.32	45.23	inner avg.
2	15.96	12.86	24.01	
3	15.60	12.38	26.01	
4	17.35	13.95	24.37	
5	18.69	14.90	25.44	
6	13.19	10.37	27.19	
7	14.58	11.63	25.37	
8	15.77	12.63	24.86	
9	21.05	12.65	66.40	
20B				outer avg.
1	26.32	20.27	29.85	inner avg.
2	16.38	13.56	20.80	
3	13.24	10.84	22.14	
4	12.37	10.51	17.70	
5	14.14	12.13	16.57	
6	13.52	11.02	22.69	
7	15.84	11.76	34.69	

Green Pine Screen Test after Log Conditioning and Stranding

Screen Fractions by Weight

Log #	1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines	Pan
P1-1A	29	21	39	50	108	136	80	29
B	42	12	51	62	145	144	84	31
C	27	10	28	62	92	123	63	13
P1-2A	32	18	41	87	115	115	63	14
B	43	34	37	86	96	97	60	33
C	48	23	37	82	102	135	74	31
P1-3A	61	25	59	90	126	121	54	16
B	30	20	50	80	135	121	60	31
C	39	23	55	74	112	148	67	34
P1-4A	109	27	60	68	96	104	64	24
B	62	28	60	58	101	91	58	23
C	88	30	33	60	95	81	61	19
P2-1A	53	30	43	58	99	107	57	18
B	94	29	58	82	106	115	62	24
C	73	33	51	71	101	114	70	35
P2-2A	83	39	66	96	127	132	58	17
B	79	61	46	96	105	106	60	20
C	71	54	68	78	119	113	65	25
P2-3A	136	46	68	66	124	100	53	14
B	77	60	81	112	119	109	62	19
C	80	72	50	74	81	84	44	15
P2-4A	54	43	67	98	116	137	58	14
B	59	43	59	75	127	125	58	28
C	56	36	65	90	108	109	53	19
P3-1A	51	26	42	54	84	75	48	13
B	64	23	40	47	90	89	46	17
C	79	22	51	82	120	109	54	11
P3-2A	68	34	53	74	70	79	36	15
B	63	27	45	80	68	57	37	12
C	108	37	71	76	83	51	30	14
P3-3A	31	15	61	82	88	89	59	13
B	41	23	47	62	113	113	63	11
C	36	12	33	66	106	82	43	8
P3-4A	29	15	25	67	116	100	41	14
B	37	30	35	74	109	30	30	7
C	21	5	30	49	134	141	56	18
P4-1A	24	13	31	48	80	111	97	16
B	11	11	32	64	98	110	92	28
C	45	5	48	106	167	173	120	31
P4-2A	113	40	52	87	116	105	48	12
B	93	23	65	95	82	66	36	11
C	89	16	41	73	117	102	49	12

% Furnish of Each Screen Fraction

Total Wts	Log #	1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines	Pan	Fines & Pan	1.5" to 0.75"
492	P1-1A	5.89	4.27	7.93	10.16	21.95	27.64	16.26	5.89	22.15	28.25
571	B	7.36	2.10	8.93	10.86	25.39	25.22	14.71	5.43	20.14	29.25
418	C	6.46	2.39	6.70	14.83	22.01	29.43	15.07	3.11	18.18	30.38
485	P1-2A	6.60	3.71	8.45	17.94	23.71	23.71	12.99	2.89	15.88	36.70
486	B	8.85	7.00	7.61	17.70	19.75	19.96	12.35	6.79	19.14	41.15
532	C	9.02	4.32	6.95	15.41	19.17	25.38	13.91	5.83	19.74	35.71
552	P1-3A	11.05	4.53	10.69	16.30	22.83	21.92	9.78	2.90	12.68	42.57
527	B	5.69	3.80	9.49	15.18	25.62	22.96	11.39	5.88	17.27	34.16
552	C	7.07	4.17	9.96	13.41	20.29	26.81	12.14	6.16	18.30	34.60
552	P1-4A	19.75	4.89	10.87	12.32	17.39	18.84	11.59	4.35	15.94	47.83
481	B	12.89	5.82	12.47	12.06	21.00	18.92	12.06	4.78	16.84	43.24
467	C	18.84	6.42	7.07	12.85	20.34	17.34	13.06	4.07	17.13	45.18
465	P2-1A	11.40	6.45	9.25	12.47	21.29	23.01	12.26	3.87	16.13	39.57
570	B	16.49	5.09	10.18	14.39	18.60	20.18	10.88	4.21	15.09	46.14
548	C	13.32	6.02	9.31	12.96	18.43	20.80	12.77	6.39	19.16	41.61
618	P2-2A	13.43	6.31	10.68	15.53	20.55	21.36	9.39	2.75	12.14	45.95
573	B	13.79	10.65	8.03	16.75	18.32	18.50	10.47	3.49	13.96	49.21
593	C	11.97	9.11	11.47	13.15	20.07	19.06	10.96	4.22	15.18	45.70
607	P2-3A	22.41	7.58	11.20	10.87	20.43	16.47	8.73	2.31	11.04	52.06
639	B	12.05	9.39	12.68	17.53	18.62	17.06	9.70	2.97	12.68	51.64
500	C	16.00	14.40	10.00	14.80	16.20	16.80	8.80	3.00	11.80	55.20
587	P2-4A	9.20	7.33	11.41	16.70	19.76	23.34	9.88	2.39	12.27	44.63
574	B	10.28	7.49	10.28	13.07	22.13	21.78	10.10	4.88	14.98	41.11
536	C	10.45	6.72	12.13	16.79	20.15	20.34	9.89	3.54	13.43	46.08
393	P3-1A	12.98	6.62	10.69	13.74	21.37	19.08	12.21	3.31	15.52	44.02
416	B	15.38	5.53	9.62	11.30	21.63	21.39	11.06	4.09	15.14	41.83
528	C	14.96	4.17	9.66	15.53	22.73	20.64	10.23	2.08	12.31	44.32
429	P3-2A	15.85	7.93	12.35	17.25	16.32	18.41	8.39	3.50	11.89	53.38
389	B	16.20	6.94	11.57	20.57	17.48	14.65	9.51	3.08	12.60	55.27
470	C	22.98	7.87	15.11	16.17	17.66	10.85	6.38	2.98	9.36	62.13
438	P3-3A	7.08	3.42	13.93	18.72	20.09	20.32	13.47	2.97	16.44	43.15
473	B	8.67	4.86	9.94	13.11	23.89	23.89	13.32	2.33	15.64	36.58
386	C	9.33	3.11	8.55	17.10	27.46	21.24	11.14	2.07	13.21	38.08
407	P3-4A	7.13	3.69	6.14	16.46	28.50	24.57	10.07	3.44	13.51	33.42
402	B	9.20	7.46	8.71	18.41	27.11	19.90	7.46	1.74	9.20	43.78
454	C	4.63	1.10	6.61	10.79	29.52	31.06	12.33	3.96	16.30	23.13
420	P4-1A	5.71	3.10	7.38	11.43	19.05	26.43	23.10	3.81	26.90	27.62
446	B	2.47	2.47	7.17	14.35	21.97	24.66	20.63	6.28	26.91	26.46
695	C	6.47	0.72	6.91	15.25	24.03	24.89	17.27	4.46	21.73	29.35
573	P4-2A	19.72	6.98	9.08	15.18	20.24	18.32	8.38	2.09	10.47	50.96
471	B	19.75	4.88	13.80	20.17	17.41	14.01	7.64	2.34	9.98	58.60
499	C	17.84	3.21	8.22	14.63	23.45	20.44	9.82	2.40	12.22	43.89

Green Pine Screen Test after Log Conditioning and Stranding Cont'd

Screen Fractions by Weight

P4-3A	29	5	25	47	104	136	85	14
B	12	2	15	37	70	120	67	18
C	6	8	10	37	115	151	78	19
P4-4A	96	34	68	102	87	86	38	26
B	95	56	78	84	107	94	53	24
C	92	66	109	93	120	102	55	26
P5-1A	69	22	49	92	73	78	27	5
B	73	35	59	103	108	93	34	10
C	47	35	56	67	91	102	30	7
P5--2A	83	24	52	65	97	88	51	15
B	55	14	60	78	115	96	51	16
C	34	11	29	55	111	97	62	25
P5-3A	16	16	27	57	80	108	47	14
B	22	18	35	55	94	142	59	19
C	12	27	30	73	121	121	61	20
P5-4A	71	18	60	82	96	99	44	17
B	32	22	41	77	102	89	46	20
C	47	30	55	58	71	73	40	15

% Furnish of Each Screen Fraction

445	P4-3A	6.52	1.12	5.62	10.56	23.37	30.56	19.10	3.15	22.25	23.82
341	B	3.52	0.59	4.40	10.85	20.53	35.19	19.65	5.28	24.93	19.35
424	C	1.42	1.89	2.36	8.73	27.12	35.61	18.40	4.48	22.88	14.39
537	P4-4A	17.88	6.33	12.66	18.99	16.20	16.01	7.08	4.84	11.92	55.87
591	B	16.07	9.48	13.20	14.21	18.10	15.91	8.97	4.06	13.03	52.96
663	C	13.88	9.95	16.44	14.03	18.10	15.38	8.30	3.92	12.22	54.30
415	P5-1A	16.63	5.30	11.81	22.17	17.59	18.80	6.51	1.20	7.71	55.90
515	B	14.17	6.80	11.46	20.00	20.97	18.06	6.60	1.94	8.54	52.43
435	C	10.80	8.05	12.87	15.40	20.92	23.45	6.90	1.61	8.51	47.13
475	P5--2A	17.47	5.05	10.95	13.68	20.42	18.53	10.74	3.16	13.89	47.16
485	B	11.34	2.89	12.37	16.08	23.71	19.79	10.52	3.30	13.81	42.68
424	C	8.02	2.59	6.84	12.97	26.18	22.88	14.62	5.90	20.52	30.42
365	P5-3A	4.38	4.38	7.40	15.62	21.92	29.59	12.88	3.84	16.71	31.78
444	B	4.95	4.05	7.88	12.39	21.17	31.98	13.29	4.28	17.57	29.28
465	C	2.58	5.81	6.45	15.70	26.02	26.02	13.12	4.30	17.42	30.54
487	P5-4A	14.58	3.70	12.32	16.84	19.71	20.33	9.03	3.49	12.53	47.43
429	B	7.46	5.13	9.56	17.95	23.78	20.75	10.72	4.66	15.38	40.09
389	C	12.08	7.71	14.14	14.91	18.25	18.77	10.28	3.86	14.14	48.84
492	Average	11.34	5.41	9.80	14.92	21.30	21.82	11.64	3.77	15.41	41.47
	St. Dev	5.26	2.64	2.72	2.84	3.17	5.03	3.55	1.32	4.37	10.42

Green Aspen Screen Test after Log Conditioning and Stranding

	Screen Fractions by Weight							
Log #	*1.5"*	*1.25"*	*1.0"*	*0.75"*	*0.5"*	*0.25"*	*Fines*	*Pan*
A1-1A	300	69	75	63	63	52	24	20
B	422	99	136	99	61	55	17	21
C	320	98	103	63	69	62	19	15
A1-2A	402	53	89	52	69	45	15	17
B	392	99	105	55	67	47	22	19
C	348	96	76	61	69	43	19	13
A1-3A	228	42	70	39	34	35	20	30
B	281	93	71	73	65	45	19	14
C	352	40	81	65	48	42	19	19
A1-4A	303	56	87	61	58	44	17	11
B	287	73	58	68	53	35	13	13
C	318	68	46	72	49	42	15	14
A2-1A	212	48	56	50	71	55	11	7
B	393	39	49	51	53	44	14	10
C	233	40	51	66	75	62	13	7
A2-2A	255	27	61	62	56	48	21	8
B	266	32	30	41	47	46	18	11
C	260	38	29	31	43	44	19	10
A2-3A	267	30	34	51	64	47	18	11
B	258	23	30	39	38	39	11	5
C	237	44	34	48	60	49	15	8
A2-4A	318	71	68	80	93	49	7	11
B	308	68	54	70	68	52	12	10
C	280	77	63	81	81	41	14	24
A3-1A	384	57	40	52	50	29	7	13
B	410	58	41	60	62	36	9	16
C	431	38	49	67	50	30	8	18
A3-2A	451	47	57	35	34	24	6	17
B	413	42	41	53	50	24	14	31
C	324	45	49	63	50	25	9	18
A3-3A	237	16	32	37	49	36	11	10
B	361	55	59	68	54	25	7	7
C	410	58	58	57	55	22	6	6
A3-4A	365	32	36	29	33	17	6	8
B	288	35	44	44	34	26	9	5
C	339	21	32	42	35	24	9	9
A4-1A	312	56	55	57	52	33	4	4
B	368	64	65	72	60	42	6	7
C	256	78	98	68	67	44	5	8
A4-2A	512	58	52	59	52	46	10	14
B	480	41	72	44	55	39	19	23
C	401	48	53	43	52	43	11	26
A4-3A	280	49	60	58	75	39	5	7
B	244	51	52	53	60	44	11	14
C	298	42	59	64	70	53	13	17

		% Furnish of Each Screen Fraction										
Total Wts	*Log #*	*1.5"*	*1.25"*	*1.0"*	*0.75"*	*0.5"*	*0.25"*	*Fines*	*Pan*	*%*	*Fines & Pan*	*1.5" to 0.75"*
666	A1-1A	45.05	10.36	11.26	9.46	9.46	7.81	3.60	3.00	100.00	6.61	76.13
910	B	46.37	10.88	14.95	10.88	6.70	6.04	1.87	2.31	100.00	4.18	83.08
749	C	42.72	13.08	13.75	8.41	9.21	8.28	2.54	2.00	100.00	4.54	77.97
742	A1-2A	54.18	7.14	11.99	7.01	9.30	6.06	2.02	2.29	100.00	4.31	80.32
806	B	48.64	12.28	13.03	6.82	8.31	5.83	2.73	2.36	100.00	5.09	80.77
725	C	48.00	13.24	10.48	8.41	9.52	5.93	2.62	1.79	100.00	4.41	80.14
498	A1-3A	45.78	8.43	14.06	7.83	6.83	7.03	4.02	6.02	100.00	10.04	76.10
661	B	42.51	14.07	10.74	11.04	9.83	6.81	2.87	2.12	100.00	4.99	78.37
666	C	52.85	6.01	12.16	9.76	7.21	6.31	2.85	2.85	100.00	5.71	80.78
637	A1-4A	47.57	8.79	13.66	9.58	9.11	6.91	2.67	1.73	100.00	4.40	79.59
600	B	47.83	12.17	9.67	11.33	8.83	5.83	2.17	2.17	100.00	4.33	81.00
624	C	50.96	10.90	7.37	11.54	7.85	6.73	2.40	2.24	100.00	4.65	80.77
510	A2-1A	41.57	9.41	10.98	9.80	13.92	10.78	2.16	1.37	100.00	3.53	71.76
653	B	60.18	5.97	7.50	7.81	8.12	6.74	2.14	1.53	100.00	3.68	81.47
547	C	42.60	7.31	9.32	12.07	13.71	11.33	2.38	1.28	100.00	3.66	71.30
538	A2-2A	47.40	5.02	11.34	11.52	10.41	8.92	3.90	1.49	100.00	5.39	75.28
491	B	54.18	6.52	6.11	8.35	9.57	9.37	3.67	2.24	100.00	5.91	75.15
474	C	54.85	8.02	6.12	6.54	9.07	9.28	4.01	2.11	100.00	6.12	75.53
522	A2-3A	51.15	5.75	6.51	9.77	12.26	9.00	3.45	2.11	100.00	5.56	73.18
443	B	58.24	5.19	6.77	8.80	8.58	8.80	2.48	1.13	100.00	3.61	79.01
495	C	47.88	8.89	6.87	9.70	12.12	9.90	3.03	1.62	100.00	4.65	73.33
697	A2-4A	45.62	10.19	9.76	11.48	13.34	7.03	1.00	1.58	100.00	2.58	77.04
642	B	47.98	10.59	8.41	10.90	10.59	8.10	1.87	1.56	100.00	3.43	77.88
661	C	42.36	11.65	9.53	12.25	12.25	6.20	2.12	3.63	100.00	5.75	75.79
632	A3-1A	60.76	9.02	6.33	8.23	7.91	4.59	1.11	2.06	100.00	3.16	84.34
692	B	59.25	8.38	5.92	8.67	8.96	5.20	1.30	2.31	100.00	3.61	82.23
691	C	62.37	5.50	7.09	9.70	7.24	4.34	1.16	2.60	100.00	3.76	84.66
671	A3-2A	67.21	7.00	8.49	5.22	5.07	3.58	0.89	2.53	100.00	3.43	87.93
668	B	61.83	6.29	6.14	7.93	7.49	3.59	2.10	4.64	100.00	6.74	82.19
583	C	55.57	7.72	8.40	10.81	8.58	4.29	1.54	3.09	100.00	4.63	82.50
428	A3-3A	55.37	3.74	7.48	8.64	11.45	8.41	2.57	2.34	100.00	4.91	75.23
636	B	56.76	8.65	9.28	10.69	8.49	3.93	1.10	1.10	100.00	2.20	85.38
672	C	61.01	8.63	8.63	8.48	8.18	3.27	0.89	0.89	100.00	1.79	86.76
526	A3-4A	69.39	6.08	6.84	5.51	6.27	3.23	1.14	1.52	100.00	2.66	87.83
485	B	59.38	7.22	9.07	9.07	7.01	5.36	1.86	1.03	100.00	2.89	84.74
511	C	66.34	4.11	6.26	8.22	6.85	4.70	1.76	1.76	100.00	3.52	84.93
573	A4-1A	54.45	9.77	9.60	9.95	9.08	5.76	0.70	0.70	100.00	1.40	83.77
684	B	53.80	9.36	9.50	10.53	8.77	6.14	0.88	1.02	100.00	1.90	83.19
624	C	41.03	12.50	15.71	10.90	10.74	7.05	0.80	1.28	100.00	2.08	80.13
803	A4-2A	63.76	7.22	6.48	7.35	6.48	5.73	1.25	1.74	100.00	2.99	84.81
773	B	62.10	5.30	9.31	5.69	7.12	5.05	2.46	2.98	100.00	5.43	82.41
677	C	59.23	7.09	7.83	6.35	7.68	6.35	1.62	3.84	100.00	5.47	80.50
573	A4-3A	48.87	8.55	10.47	10.12	13.09	6.81	0.87	1.22	100.00	2.09	78.01
529	B	46.12	9.64	9.83	10.02	11.34	8.32	2.08	2.65	100.00	4.73	75.61
616	C	48.38	6.82	9.58	10.39	11.36	8.60	2.11	2.76	100.00	4.87	75.16

Green Aspen Screen Test after Log Conditioning and Stranding Cont'd

	Screen Fractions by Weight							
Log #	*1.5"*	*1.25"*	*1.0"*	*0.75"*	*0.5"*	*0.25"*	*Fines*	*Pan*
A4-4A	340	45	46	46	49	46	14	11
B	305	55	43	35	42	31	11	5
C	270	54	44	48	55	45	20	10
A5-1A	196	59	77	109	83	64	11	10
B	278	65	60	78	84	70	10	12
C	273	54	55	64	79	60	14	12
A5--2A	280	50	51	61	47	43	4	10
B	280	73	77	76	73	60	11	8
C	357	54	53	67	62	50	12	9
A5-3A	284	45	58	61	50	36	5	6
B	218	57	67	65	74	53	11	16
C	382	57	69	89	81	56	13	16
A5-4A	372	49	85	66	87	66	25	26
B	190	23	29	31	33	23	5	6
C	281	74	70	45	49	49	16	13

		% Furnish of Each Screen Fraction										
Total Wts	*Log #*	*1.5"*	*1.25"*	*1.0"*	*0.75"*	*0.5"*	*0.25"*	*Fines*	*Pan*	*%*	*Fines & Pan*	*1.5" to 0.75"*
597	A4-4A	56.95	7.54	7.71	7.71	8.21	7.71	2.35	1.84	100.00	4.19	79.90
527	B	57.87	10.44	8.16	6.64	7.97	5.88	2.09	0.95	100.00	3.04	83.11
546	C	49.45	9.89	8.06	8.79	10.07	8.24	3.66	1.83	100.00	5.49	76.19
609	A5-1A	32.18	9.69	12.64	17.90	13.63	10.51	1.81	1.64	100.00	3.45	72.41
657	B	42.31	9.89	9.13	11.87	12.79	10.65	1.52	1.83	100.00	3.35	73.21
611	C	44.68	8.84	9.00	10.47	12.93	9.82	2.29	1.96	100.00	4.26	73.00
546	A5--2A	51.28	9.16	9.34	11.17	8.61	7.88	0.73	1.83	100.00	2.56	80.95
658	B	42.55	11.09	11.70	11.55	11.09	9.12	1.67	1.22	100.00	2.89	76.90
664	C	53.77	8.13	7.98	10.09	9.34	7.53	1.81	1.36	100.00	3.16	79.97
545	A5-3A	52.11	8.26	10.64	11.19	9.17	6.61	0.92	1.10	100.00	2.02	82.20
561	B	38.86	10.16	11.94	11.59	13.19	9.45	1.96	2.85	100.00	4.81	72.55
763	C	50.07	7.47	9.04	11.66	10.62	7.34	1.70	2.10	100.00	3.80	78.24
776	A5-4A	47.94	6.31	10.95	8.51	11.21	8.51	3.22	3.35	100.00	6.57	73.71
340	B	55.88	6.76	8.53	9.12	9.71	6.76	1.47	1.76	100.00	3.24	80.29
597	C	47.07	12.40	11.73	7.54	8.21	8.21	2.68	2.18	100.00	4.86	78.73
	Average	51.71	8.61	9.45	9.49	9.53	7.06	2.08	2.07		4.15	79.26
	St. Dev.	7.74	2.37	2.38	2.10	2.15	1.99	0.89	0.93		1.51	4.25

MPB Log Screen Test after 0 Day Sprinkling and Stranding

	Screen Fractions by Weight							
Log #	*1.5"*	*1.25"*	*1.0"*	*0.75"*	*0.5"*	*0.25"*	*Fines*	*Pan*
1A-A	9	14	12	42	82	147	62	15
B	10	14	24	51	122	170	86	27
C	18	25	26	50	126	173	72	20
2B-A	7	4	12	36	90	142	80	21
B	10	6	21	50	102	153	91	30
C	21	14	27	61	87	139	89	29
3C-A	5	5	12	60	95	150	87	18
B	10	0	17	35	78	137	82	23
C	11	3	17	42	72	152	79	24
4D-A	2	0	4	16	80	173	93	25
B	2	2	17	22	104	183	117	49
C	0	0	4	17	76	174	105	28
5A-A	9	9	33	62	119	160	99	32
B	6	11	30	69	134	193	103	54
C	8	3	23	50	109	169	94	47
6B-A	23	18	29	48	71	100	93	45
B	21	11	34	57	73	127	68	20
C	21	15	22	47	65	131	80	23
7C-A	15	8	35	38	64	108	109	70
B	20	18	34	70	106	187	99	19
C	28	19	35	37	84	145	110	39
8D-A	36	21	45	67	101	154	56	21
B	18	18	45	91	137	176	67	26
C	25	19	32	45	65	120	66	40
9A-A	12	10	27	76	116	166	72	32
B	16	12	46	80	101	144	65	31
C	14	6	23	55	121	130	65	39
10B-A	31	11	21	47	113	180	65	14
B	31	8	33	66	101	162	58	16
C	40	8	38	56	124	171	66	15
11C-A	39	17	33	68	122	172	98	30
B	35	11	33	69	135	162	75	17
C	41	17	44	75	92	144	84	35
12D-A	5	0	7	28	93	192	107	34
B	0	6	7	27	90	201	106	32
C	6	0	8	22	68	158	84	22
13A-A	96	19	51	76	95	118	65	26
B	34	21	40	57	98	145	94	53
C	35	16	29	63	94	163	96	57
14B-A	5	0	3	27	98	139	68	24
B	4	0	9	12	51	128	70	49
C	5	6	12	28	88	178	84	42

		% Furnish of Each Screen Fraction										
Total Wts	*Log #*	*1.5"*	*1.25"*	*1.0"*	*0.75"*	*0.5"*	*0.25"*	*Fines*	*Pan*		*Fines & Pan*	*1.5" to 0.75"*
383	1A-A	2.35	3.66	3.13	10.97	21.41	38.38	16.19	3.92	100.00	20.10	20.10
504	B	1.98	2.78	4.76	10.12	24.21	33.73	17.06	5.36	100.00	22.42	19.64
510	C	3.53	4.90	5.10	9.80	24.71	33.92	14.12	3.92	100.00	18.04	23.33
392	2B-A	1.79	1.02	3.06	9.18	22.96	36.22	20.41	5.36	100.00	25.77	15.05
463	B	2.16	1.30	4.54	10.80	22.03	33.05	19.65	6.48	100.00	26.13	18.79
467	C	4.50	3.00	5.78	13.06	18.63	29.76	19.06	6.21	100.00	25.27	26.34
432	3C-A	1.16	1.16	2.78	13.89	21.99	34.72	20.14	4.17	100.00	24.31	18.98
382	B	2.62	0.00	4.45	9.16	20.42	35.86	21.47	6.02	100.00	27.49	16.23
400	C	2.75	0.75	4.25	10.50	18.00	38.00	19.75	6.00	100.00	25.75	18.25
393	4D-A	0.51	0.00	1.02	4.07	20.36	44.02	23.66	6.36	100.00	30.03	5.60
496	B	0.40	0.40	3.43	4.44	20.97	36.90	23.59	9.88	100.00	33.47	8.67
404	C	0.00	0.00	0.99	4.21	18.81	43.07	25.99	6.93	100.00	32.92	5.20
523	5A-A	1.72	1.72	6.31	11.85	22.75	30.59	18.93	6.12	100.00	25.05	21.61
600	B	1.00	1.83	5.00	11.50	22.33	32.17	17.17	9.00	100.00	26.17	19.33
503	C	1.59	0.60	4.57	9.94	21.67	33.60	18.69	9.34	100.00	28.03	16.70
427	6B-A	5.39	4.22	6.79	11.24	16.63	23.42	21.78	10.54	100.00	32.32	27.63
411	B	5.11	2.68	8.27	13.87	17.76	30.90	16.55	4.87	100.00	21.41	29.93
404	C	5.20	3.71	5.45	11.63	16.09	32.43	19.80	5.69	100.00	25.50	25.99
447	7C-A	3.36	1.79	7.83	8.50	14.32	24.16	24.38	15.66	100.00	40.04	21.48
553	B	3.62	3.25	6.15	12.66	19.17	33.82	17.90	3.44	100.00	21.34	25.68
497	C	5.63	3.82	7.04	7.44	16.90	29.18	22.13	7.85	100.00	29.98	23.94
501	8D-A	7.19	4.19	8.98	13.37	20.16	3.. 74	11.18	4.19	100.00	15.37	33.73
578	B	3.11	3.11	7.79	15.74	23.70	30.45	11.59	4.50	100.00	16.09	29.76
412	C	6.07	4.61	7.77	10.92	15.78	29.13	16.02	9.71	100.00	25.73	29.37
511	9A-A	2.35	1.96	5.28	14.87	22.70	32.49	14.09	6.26	100.00	20.35	24.46
495	B	3.23	2.42	9.29	16.16	20.40	29.09	13.13	6.26	100.00	19.39	31.11
453	C	3.09	1.32	5.08	12.14	26.71	28.70	14.35	8.61	100.00	22.96	21.63
482	10B-A	6.43	2.28	4.36	9.75	23.44	37.34	13.49	2.90	100.00	16.39	22.82
475	B	6.53	1.68	6.95	13.89	21.26	34.11	12.21	3.37	100.00	15.58	29.05
518	C	7.72	1.54	7.34	10.81	23.94	33.01	12.74	2.90	100.00	15.64	27.41
579	11C-A	6.74	2.94	5.70	11.74	21.07	29.71	16.93	5.18	100.00	22.11	27.12
537	B	6.52	2.05	6.15	12.85	25.14	30.17	13.97	3.17	100.00	17.13	27.56
532	C	7.71	3.20	8.27	14.10	17.29	27.07	15.79	6.58	100.00	22.37	33.27
486	12D-A	1.07	0.00	1.50	6.01	19.96	41.20	22.96	7.30	100.00	30.26	8.58
469	B	0.00	1.28	1.49	5.76	19.19	42.86	22.60	6.82	100.00	29.42	8.53
368	C	1.63	0.00	2.17	5.98	18.48	42.93	22.83	5.98	100.00	28.80	9.78
546	13A-A	17.58	3.48	9.34	13.92	17.40	21.61	11.90	4.76	100.00	16.67	44.32
542	B	6.27	3.87	7.38	10.52	18.08	26.75	17.34	9.78	100.00	27.12	28.04
553	C	6.33	2.89	5.24	11.39	17.00	29.48	17.36	10.31	100.00	27.67	25.86
364	14B-A	1.37	0.00	0.82	7.42	26.92	38.19	18.68	6.59	100.00	25.27	9.62
323	B	1.24	0.00	2.79	3.72	15.79	39.63	21.67	15.17	100.00	36.84	7.74
443	C	1.13	1.35	2.71	6.32	19.86	40.18	18.96	9.48	100.00	28.44	11.51

MPB Log Screen Test after 0 Day Sprinkling and Stranding Cont'd

	Screen Fractions by Weight							
Log #	*1.5"*	*1.25"*	*1.0"*	*0.75"*	*0.5"*	*0.25"*	*Fines*	*Pan*
15C-A	60	18	46	82	122	157	51	16
B	69	46	64	115	168	192	57	19
C	51	25	71	92	122	173	56	18
16D-A	54	12	41	80	127	193	57	23
B	29	27	68	95	153	162	51	18
C	12	12	42	69	132	152	44	15
17A-A	0	0	6	24	51	176	102	29
B	0	0	2	18	46	132	110	22
C	0	0	5	22	65	174	118	28
18B-A	0	0	5	19	74	189	132	31
B	3	0	8	18	116	192	125	29
C	0	0	3	21	93	207	132	51
19C-A	62	45	62	101	113	136	44	22
B	90	30	75	131	140	129	46	25
C	69	23	51	89	103	102	41	10
20D-A	0	0	20	36	60	136	85	40
B	0	4	14	29	85	173	80	17
C	0	8	10	38	88	184	85	24

		% Furnish of Each Screen Fraction										
Total Wts	*Log #*	*1.5"*	*1.25"*	*1.0"*	*0.75"*	*0.5"*	*0.25"*	*Fines*	*Pan*		*Fines & Pan*	*1.5" to 0.75"*
552	15C-A	10.87	3.26	8.33	14.86	22.10	28.44	9.24	2.90	100.00	12.14	37.32
730	B	9.45	6.30	8.77	15.75	23.01	26.30	7.81	2.60	100.00	10.41	40.27
608	C	8.39	4.11	11.68	15.13	20.07	28.45	9.21	2.96	100.00	12.17	39.31
587	16D_A	9.20	2.04	6.98	13.63	21.64	32.88	9.71	3.92	100.00	13.63	31.86
603	B	4.81	4.48	11.28	15.75	25.37	26.87	8.46	2.99	100.00	11.44	36.32
478	C	2.51	2.51	8.79	14.44	27.62	31.80	9.21	3.14	100.00	12.34	28.24
388	17A-A	0.00	0.00	1.55	6.19	13.14	45.36	26.29	7.47	100.00	33.76	7.73
330	B	0.00	0.00	0.61	5.45	13.94	40.00	33.33	6.67	100.00	40.00	6.06
412	C	0.00	0.00	1.21	5.34	15.78	42.23	28.64	6.80	100.00	35.44	6.55
450	18B-A	0.00	0.00	1.11	4.22	16.44	42.00	29.33	6.89	100.00	36.22	5.33
491	B	0.61	0.00	1.63	3.67	23.63	39.10	25.46	5.91	100.00	31.36	5.91
507	C	0.00	0.00	0.59	4.14	18.34	40.83	26.04	10.06	100.00	36.09	4.73
585	19C-A	10.60	7.69	10.60	17.26	19.32	23.25	7.52	3.76	100.00	11.28	46.15
666	B	13.51	4.50	11.26	19.67	21.02	19.37	6.91	3.75	100.00	10.66	48.95
488	C	14.14	4.71	10.45	18.24	21.11	20.90	8.40	2.05	100.00	10.45	47.54
377	20D-A	0.00	0.00	5.31	9.55	15.92	36.07	22.55	10.61	100.00	33.16	14.85
402	B	0.00	1.00	3.48	7.21	21.14	43.03	19.90	4.23	100.00	24.13	11.69
437	C	0.00	1.83	2.29	8.70	20.14	42.11	19.45	5.49	100.00	24.94	12.81
	Average	4.06	2.15	5.38	10.59	20.27	33.53	17.76	6.25		24.01	22.19
	St. Dev.	3.95	1.80	3.07	4.05	3.30	6.40	6.01	2.88		8.00	11.73

MPB Log Screen Test after 10 Days Sprinkling and Stranding

	Screen Fractions by Weight						
Log #	*1.5"*	*1.25"*	*1.0"*	*0.75"*	*0.5"*	*0.25"*	*Fines*	*Pan*
1B-A	18	14	24	71	132	143	83	22
B	24	11	48	97	136	195	80	28
C	46	26	60	107	178	278	107	23
2C-A	73	43	64	96	124	139	56	24
B	65	30	44	84	127	166	62	38
C	79	44	50	85	91	132	56	26
3D-A	7	12	31	54	110	171	66	20
B	13	14	34	54	100	185	64	21
C	20	19	38	57	116	183	63	20
4A-A	37	15	18	41	94	136	59	19
B	30	13	31	49	89	136	58	21
C	75	22	39	59	117	179	57	16
5B-A	50	42	63	86	107	106	41	21
B	62	20	51	84	97	105	40	14
C	95	58	62	94	103	104	42	18
6C-A	33	9	36	56	99	164	62	24
B	29	19	25	54	95	171	79	28
C	39	16	42	61	99	164	75	30
7D-A	18	8	16	42	107	274	128	30
B	21	15	16	42	124	303	138	33
C	22	8	29	40	112	207	87	21
8A-A	30	27	49	49	97	169	113	101
B	39	30	38	85	102	147	76	74
C	89	29	56	94	103	140	70	60
9B-A	23	21	35	93	137	197	60	28
B	52	15	52	76	121	193	71	35
C	30	22	40	91	112	199	67	40
10C-A	63	24	61	91	157	202	51	15
B	42	40	34	84	135	164	49	18
C	46	24	39	69	121	133	39	14
11D-A	93	43	60	97	142	165	60	23
B	61	35	68	130	156	285	99	44
C	48	27	35	112	174	212	85	51
12A-A	46	39	39	85	126	183	58	15
B	21	31	49	70	89	138	42	20
C	73	22	45	77	121	160	42	17
13B-A	57	23	46	91	174	241	114	49
B	18	23	43	72	116	236	104	31
C	30	14	21	65	93	185	91	41
14C-A	7	12	27	35	106	270	76	25
B	24	11	42	68	137	242	91	28
C	19	12	25	58	111	215	68	46

		% Furnish of Each Screen Fraction										
Total Wts	*Log #*	*1.5"*	*1.25"*	*1.0"*	*0.75"*	*0.5"*	*0.25"*	*Fines*	*Pan*		*Fines & Pan*	*1.5" to 0.75"*
507	1B-A	3.55	2.76	4.73	14.00	26.04	28.21	16.37	4.34	100.00	20.71	25.05
619	B	3.88	1.78	7.75	15.67	21.97	31.50	12.92	4.52	100.00	17.45	29.08
825	C	5.58	3.15	7.27	12.97	21.58	33.70	12.97	2.79	100.00	15.76	28.97
619	2C-A	11.79	6.95	10.34	15.51	20.03	22.46	9.05	3.88	100.00	12.92	44.59
616	B	10.55	4.87	7.14	13.64	20.62	26.95	10.06	6.17	100.00	16.23	36.20
563	C	14.03	7.82	8.88	15.10	16.16	23.45	9.95	4.62	100.00	14.56	45.83
471	3D-A	1.49	2.55	6.58	11.46	23.35	36.31	14.01	4.25	100.00	18.26	22.09
485	B	2.68	2.89	7.01	11.13	20.62	38.14	13.20	4.33	100.00	17.53	23.71
516	C	3.88	3.68	7.36	11.05	22.48	35.47	12.21	3.88	100.00	16.09	25.97
419	4A-A	8.83	3.58	4.30	9.79	22.43	32.46	14.08	4.53	100.00	18.62	26.49
427	B	7.03	3.04	7.26	11.48	20.84	31.85	13.58	4.92	100.00	18.50	28.81
564	C	13.30	3.90	6.91	10.46	20.74	31.74	10.11	2.84	100.00	12.94	34.57
516	5B-A	9.69	8.14	12.21	16.67	20.74	20.54	7.95	4.07	100.00	12.02	46.71
473	B	13.11	4.23	10.78	17.76	20.51	22.20	8.46	2.96	100.00	11.42	45.88
576	C	16.49	10.07	10.76	16.32	17.88	18.06	7.29	3.13	100.00	10.42	53.65
483	6C-A	6.83	1.86	7.45	11.59	20.50	33.95	12.84	4.97	100.00	17.81	27.74
500	B	5.80	3.80	5.00	10.80	19.00	34.20	15.80	5.60	100.00	21.40	25.40
526	C	7.41	3.04	7.98	11.60	18.82	31.18	14.26	5.70	100.00	19.96	30.04
623	7D-A	2.89	1.28	2.57	6.74	17.17	43.98	20.55	4.82	100.00	25.36	13.48
692	B	3.03	2.17	2.31	6.07	17.92	43.79	19.94	4.77	100.00	24.71	13.58
526	C	4.18	1.52	5.51	7.60	21.29	39.35	16.54	3.99	100.00	20.53	18.82
635	8A-A	4.72	4.25	7.72	7.72	15.28	26.61	17.80	15.91	100.00	33.70	24.41
591	B	6.60	5.08	6.43	14.38	17.26	24.87	12.86	12.52	100.00	25.38	32.49
641	C	13.88	4.52	8.74	14.66	16.07	21.84	10.92	9.36	100.00	20.28	41.81
594	9B-A	3.87	3.54	5.89	15.66	23.06	33.16	10.10	4.71	100.00	14.81	28.96
615	B	8.46	2.44	8.46	12.36	19.67	31.33	11.54	5.69	100.00	17.24	31.71
601	C	4.99	3.66	6.66	15.14	18.64	33.11	11.15	6.66	100.00	17.80	30.45
664	10C-A	9.49	3.61	9.19	13.70	23.64	30.42	7.68	2.26	100.00	9.94	35.99
566	B	7.42	7.07	6.01	14.84	23.85	28.98	8.66	3.18	100.00	11.84	35.34
485	C	9.48	4.95	8.04	14.23	24.95	27.42	8.04	2.89	100.00	10.93	36.70
683	11D-A	13.62	6.30	8.78	14.20	20.79	24.16	8.78	3.37	100.00	12.15	42.90
878	B	6.95	3.99	7.74	14.81	17.77	32.46	11.28	5.01	100.00	16.29	33.49
744	C	6.45	3.63	4.70	15.05	23.39	28.49	11.42	6.85	100.00	18.28	29.84
591	12A-A	7.78	6.60	6.60	14.38	21.32	30.96	9.81	2.54	100.00	12.35	35.36
460	B	4.57	6.74	10.65	15.22	19.35	30.00	9.13	4.35	100.00	13.48	37.17
557	C	13.11	3.95	8.08	13.82	21.72	28.73	7.54	3.05	100.00	10.59	38.96
795	13B-A	7.17	2.89	5.79	11.45	21.89	30.31	14.34	6.16	100.00	20.50	27.30
643	B	2.80	3.58	6.69	11.20	18.04	36.70	16.17	4.82	100.00	21.00	24.26
540	C	5.56	2.59	3.89	12.04	17.22	34.26	16.85	7.59	100.00	24.44	24.07
558	14C-A	1.25	2.15	4.84	6.27	19.00	48.39	13.62	4.48	100.00	18.10	14.52
643	B	3.73	1.71	6.53	10.58	21.31	37.64	14.15	4.35	100.00	18.51	22.55
574	C	3.31	2.09	4.36	10.10	19.34	37.46	15.33	8.01	100.00	23.34	19.86

MPB Log Screen Test after 10 Days Sprinkling and Stranding Cont'd

		Screen Fractions by Weight							
15D-A	19	29	66	139	176	240	55	25
B	52	26	64	115	176	210	44	13
C	13	36	35	125	215	273	71	25
16A-A	38	16	43	72	103	163	51	18
B	24	23	32	79	123	174	47	22
C	174	52	52	85	127	147	39	24
17B-A	0	4	13	47	131	246	122	31
B	8	5	15	43	107	175	73	19
C	5	8	19	32	115	198	80	28
18C-A	19	5	16	42	84	197	102	38
B	9	14	17	48	110	201	120	36
C	9	0	19	29	94	195	96	31
19D-A	99	61	76	89	123	153	45	21
B	71	57	86	77	114	136	39	19
C	173	51	71	101	122	129	31	13
20A-A	44	17	43	59	130	190	61	18
B	22	13	48	68	118	205	76	20
C	34	9	24	50	83	164	77	21

		% Furnish of Each Screen Fraction										
749	15D-A	2.54	3.87	8.81	18.56	23.50	32.04	7.34	3.34	100.00	10.68	33.78
700	B	7.43	3.71	9.14	16.43	25.14	30.00	6.29	1.86	100.00	8.14	36.71
793	C	1.64	4.54	4.41	15.76	27.11	34.43	8.95	3.15	100.00	12.11	26.36
504	16A-A	7.54	3.17	8.53	14.29	20.44	32.34	10.12	3.57	100.00	13.69	33.53
524	B	4.58	4.39	6.11	15.08	23.47	33.21	6.97	4.20	100.00	13.17	30.15
700	C	24.86	7.43	7.43	12.14	18.14	21.00	5.57	3.43	100.00	9.00	51.86
594	17B-A	0.00	0.67	2.19	7.91	22.05	41.41	20.54	5.22	100.00	25.76	10.77
445	B	1.80	1.12	3.37	9.66	24.04	39.33	16.40	4.27	100.00	20.67	15.96
485	C	1.03	1.65	3.92	6.60	23.71	40.82	16.49	5.77	100.00	22.27	13.20
503	18C-A	3.78	0.99	3.18	8.35	16.70	39.17	20.28	7.55	100.00	27.83	16.30
554	B	1.44	2.53	3.07	8.66	19.86	36.28	21.66	6.50	100.00	28.16	15.70
473	C	1.90	0.00	4.02	6.13	19.87	41.23	20.30	6.55	100.00	26.85	12.05
667	19D-A	14.84	9.15	11.39	13.34	18.44	22.94	6.75	3.15	100.00	9.90	48.73
605	B	12.73	9.42	14.21	12.73	18.84	22.48	6.45	3.14	100.00	9.59	49.09
691	C	25.04	7.38	10.27	14.62	17.66	18.67	4.49	1.88	100.00	6.37	57.31
562	20A-A	7.83	3.02	7.65	10.50	23.13	33.81	10.85	3.20	100.00	14.06	29.00
570	B	3.86	2.28	8.42	11.93	20.70	35.96	13.33	3.51	100.00	16.84	26.49
462	C	7.36	1.95	5.19	10.82	17.97	35.50	16.67	4.55	100.00	21.21	25.32
	Average	7.19	3.93	6.95	12.38	20.58	31.79	12.35	4.83		17.17	30.45
	St. Dev.	5.23	2.26	2.55	3.10	2.63	6.64	4.26	2.36		5.78	11.03

MPB Log Screen Test after 20 Days Sprinkling and Stranding

		Screen Fractions by Weight						
Log #	*1.5"*	*1.25"*	*1.0"*	*0.75"*	*0.5"*	*0.25"*	*Fines*	*Pan*
1C-A	27	52	20	66	145	223	68	20
B	18	10	31	69	58	207	64	21
C	13	29	24	90	143	226	78	24
2D-A	79	30	56	69	118	116	53	37
B	91	20	32	63	100	105	50	32
C	50	32	46	74	109	164	87	58
3A-A	6	7	33	108	166	228	101	39
B	5	7	32	55	96	206	94	30
C	5	3	26	51	113	228	103	39
4B-A	46	32	36	66	121	153	72	23
B	46	38	72	99	179	221	73	39
C	44	85	74	85	158	225	91	49
5C-A	124	51	66	124	153	182	41	13
B	65	66	82	159	162	204	63	23
C	69	70	96	130	150	176	56	27
6D-A	17	19	23	49	75	170	77	21
B	73	25	23	63	77	161	62	13
C	31	18	30	47	80	155	75	35
7A-A	29	16	35	71	141	335	155	69
B	25	4	17	39	87	264	122	37
C	10	7	39	48	118	268	110	59
8B-A	48	14	10	70	148	197	77	64
B	45	47	44	47	105	181	75	53
C	33	33	30	47	128	283	156	106
9C-A	71	35	58	102	128	138	40	18
B	36	13	39	62	88	132	51	24
C	48	24	50	87	112	128	47	19
10D-A	43	32	42	57	148	217	68	14
B	61	37	38	77	108	170	68	18
C	84	44	68	95	148	165	52	26
11A-A	31	13	37	85	142	207	51	18
B	74	30	47	89	129	204	69	32
C	69	46	60	117	150	254	95	51
12B-A	129	51	72	98	103	134	47	29
B	99	50	58	76	113	139	42	36
C	154	68	107	84	97	149	42	24
13C-A	20	11	34	93	143	287	116	50
B	21	22	28	87	146	286	112	48
C	80	36	53	97	131	226	78	48
14D-A	16	6	14	61	102	174	73	30
B	43	14	30	67	141	249	82	33
C	16	12	24	90	119	245	96	57

		% Furnish of Each Screen Fraction											
Total Wts	*Log #*	*1.5"*	*1.25"*	*1.0"*	*0.75"*	*0.5"*	*0.25"*	*Fines*	*Pan*		*Fines & Pan*	*1.5" to 0.75"*	
581	1C-A	4.65	2.07	3.44	11.36	24.96	38.38	11.70	3.44	500.00	15.15	21.51	
508	B	3.54	1.97	6.10	13.58	17.32	40.75	12.60	4.13	500.00	16.73	25.20	
631	C	2.06	4.44	3.80	15.06	22.66	35.82	12.36	3.80	500.00	16.16	25.36	
555	2D-A	13.69	5.41	10.09	12.43	21.26	20.90	9.56	6.67	500.00	16.22	41.62	
495	B	18.79	4.04	6.46	12.73	20.20	21.21	10.10	6.46	500.00	16.57	42.02	
620	C	8.06	5.16	7.42	11.94	17.58	26.45	14.03	9.35	500.00	23.39	32.58	
688	3A-A	0.87	1.02	4.80	15.70	24.13	33.14	14.68	5.67	500.00	20.35	22.38	
527	B	0.95	1.33	5.07	10.44	18.60	39.09	17.84	5.69	500.00	23.53	18.79	
568	C	0.88	0.53	4.58	8.98	19.89	40.14	18.13	6.87	500.00	25.00	14.98	
549	4B-A	8.38	5.83	6.56	12.02	22.04	27.87	11.11	4.19	500.00	15.30	32.79	
767	B	6.00	4.95	9.39	12.91	23.34	28.81	9.52	5.08	500.00	14.60	33.25	
751	C	5.86	5.99	9.85	8.66	21.04	29.96	12.12	6.52	500.00	18.64	30.36	
754	5C-A	16.45	6.76	8.75	16.45	20.29	24.14	5.44	1.72	500.00	7.16	48.41	
629	B	7.24	7.96	11.10	19.18	19.54	24.61	7.60	2.77	500.00	10.37	45.48	
774	C	8.91	9.04	12.40	16.80	19.38	22.74	7.24	3.49	500.00	10.72	47.16	
451	6D-A	3.77	4.21	5.10	10.86	16.63	37.69	17.07	4.66	500.00	21.73	23.95	
495	B	14.75	5.05	4.65	12.32	15.56	32.53	12.53	2.63	500.00	15.15	36.77	
467	C	6.64	3.00	6.42	10.06	17.13	33.19	16.06	7.49	500.00	23.55	26.12	
851	7A-A	3.41	1.88	4.11	8.34	16.57	39.37	18.21	8.11	500.00	26.32	17.74	
615	B	4.13	0.68	2.81	6.45	16.03	43.64	20.17	6.12	500.00	26.29	14.05	
698	C	7.16	1.00	5.58	6.87	16.88	38.34	15.74	8.44	500.00	24.18	20.60	
666	8B-A	6.91	2.10	7.51	10.51	22.22	29.58	11.56	9.61	500.00	21.17	27.03	
601	B	7.49	7.82	7.32	7.82	17.47	30.12	13.14	8.82	500.00	21.96	30.45	
816	C	4.04	4.04	3.68	5.76	15.69	34.68	19.12	12.97	500.00	32.11	17.52	
625	9C-A	11.36	6.24	14.24	16.32	20.48	22.08	6.40	2.88	500.00	9.28	48.16	
465	B	7.74	7.10	8.39	13.33	18.92	28.39	10.97	5.16	500.00	16.13	36.56	
505	C	9.50	4.75	9.90	17.23	20.20	25.35	9.31	3.76	500.00	13.07	41.39	
691	10D-A	6.31	4.70	9.10	14.24	21.73	31.86	9.99	2.06	500.00	12.04	34.36	
563	B	10.83	6.57	6.75	13.68	19.18	31.26	8.53	3.20	500.00	11.72	37.83	
683	C	12.37	6.44	9.96	14.06	21.67	24.16	7.61	3.81	500.00	11.42	42.75	
564	11A-A	5.50	2.30	6.56	11.52	25.18	36.70	9.04	3.19	500.00	12.23	25.89	
654	B	11.31	4.59	7.19	10.55	19.72	31.19	10.55	4.89	490.30	15.44	33.64	
842	C	8.19	5.46	7.13	13.90	17.81	30.17	11.25	6.06	500.00	17.34	34.68	
662	12B-A	19.49	7.55	10.88	14.80	15.96	20.24	7.51	4.38	500.00	11.48	52.72	
618	B	15.86	9.06	9.39	12.30	18.29	22.49	8.80	5.83	500.00	12.62	46.60	
723	C	21.30	9.53	14.80	11.42	13.42	20.61	5.81	3.32	500.00	9.13	56.95	
773	13C-A	2.59	3.88	4.40	12.03	18.50	37.13	15.01	6.47	500.00	21.47	22.90	
741	B	2.83	2.97	5.26	11.74	19.70	35.90	15.11	6.48	500.00	21.59	22.83	
749	C	10.68	4.81	7.08	12.95	17.49	30.17	10.41	6.41	500.00	16.82	35.51	
476	14D-A	5.36	1.26	2.94	12.82	21.43	36.55	15.34	4.30	500.00	21.64	20.38	
659	B	6.53	2.12	4.55	10.17	21.40	37.79	12.44	5.01	500.00	17.45	23.37	
649	C	2.47	1.85	3.70	12.33	18.34	37.75	14.79	8.78	500.00	23.57	20.34	

WPB Log Screen Test after 28 Days Sprinkling and Shredding Cont'd

		Screen Fractions by Weight							
Log #	1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines	Pan
15A-A	25	29	45	81	108	178	48	14
B	20	36	54	93	106	225	56	15
C	62	16	26	73	102	197	69	22
16B-A	42	37	73	106	123	165	46	13
B	58	41	67	103	136	185	31	15
C	76	57	79	138	189	227	42	18
17C-A	20	22	41	65	98	205	118	42
B	40	23	47	81	98	204	112	52
C	35	35	42	69	120	244	117	47
18D-A	15	6	21	51	130	224	86	28
B	22	14	23	54	122	230	101	25
C	31	5	24	80	139	216	82	35
19A-A	169	50	47	111	106	110	23	17
B	66	47	57	100	104	145	32	19
C	67	58	71	107	105	146	37	25
20B-A	16	17	27	90	149	180	70	45
B	34	25	31	71	115	159	66	29
C	20	41	51	74	132	239	79	34

		% Fraction of Each Screen Fraction										
Total Wts	Log #	1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines	Pan		Fines & Pan	1.5" to 0.75"
528	15A-A	4.73	5.49	8.52	15.34	20.45	33.71	9.09	2.65	100.00	11.74	34.09
716	B	15.83	5.15	7.54	12.27	20.56	29.48	7.26	1.90	100.00	9.37	40.97
884	C	11.76	3.29	6.33	15.98	23.83	28.96	9.93	3.97	100.00	13.90	33.94
605	16B-A	6.94	6.12	12.07	17.32	20.33	27.27	7.60	2.15	100.00	9.75	42.64
636	B	9.12	6.45	10.53	16.19	21.38	29.09	4.87	2.36	100.00	7.23	42.30
826	C	9.20	6.90	9.56	16.71	22.88	27.48	5.08	2.18	100.00	7.26	42.37
611	17C-A	3.27	3.60	6.71	10.64	16.04	33.55	19.31	6.87	100.00	26.19	24.22
657	B	6.09	3.50	7.15	12.33	14.92	31.05	17.05	7.91	100.00	24.96	29.07
709	C	4.94	4.94	5.92	9.73	16.93	34.41	16.50	6.63	100.00	23.13	25.53
561	18D-A	2.67	1.07	3.74	9.09	23.17	39.93	15.33	4.99	100.00	20.32	16.58
591	B	3.72	2.37	3.89	9.14	20.64	38.92	17.09	4.23	100.00	21.32	19.12
612	C	5.07	0.82	3.92	13.07	22.71	35.29	13.40	5.72	100.00	19.12	22.88
633	19A-A	26.70	7.90	7.42	17.54	16.75	17.38	3.63	2.69	100.00	6.32	59.56
570	B	11.58	8.25	10.00	17.54	18.25	25.44	5.61	3.33	100.00	8.95	47.37
616	C	10.88	9.42	11.53	17.37	17.05	23.70	6.01	4.06	100.00	10.06	49.19
594	20B-A	2.69	2.86	4.55	15.15	25.08	30.30	11.78	7.58	100.00	19.36	25.25
530	B	6.42	4.72	5.85	13.40	21.70	30.00	12.45	5.47	100.00	17.92	30.38
670	C	2.99	6.12	7.61	11.04	19.70	35.67	11.79	5.07	100.00	16.87	27.76
	Average	7.95	4.60	7.21	12.67	19.63	31.07	11.67	5.21		16.88	32.42
	St. Dev.	5.40	2.44	2.83	3.03	2.75	6.20	4.21	2.28		5.98	11.17

MPB Log Screen Test after 30 Days Sprinkling and Stranding

	Screen Fractions by Weight						
Log #	*1.5"*	*1.25"*	*1.0"*	*0.75"*	*0.5"*	*Fines*	*Pan*
1D-A	29	27	36	86	143	194	57	19
B	24	21	49	73	160	246	89	29
C	46	28	62	105	172	292	111	40
2A-A	74	31	53	59	106	193	63	20
B	97	45	74	83	149	234	50	53
C	118	30	66	64	146	205	75	37
3B-A	11	26	42	76	123	265	108	29
B	20	20	41	67	160	287	91	39
C	17	13	64	91	172	309	131	42
4C-A	36	28	65	80	116	194	64	30
B	59	41	67	141	159	255	79	48
C	55	36	54	79	136	188	63	33
5D-A	107	73	81	155	132	140	47	18
B	144	64	82	133	149	140	44	26
C	68	61	100	151	182	178	57	35
6A-A	60	42	49	64	109	248	88	22
B	53	34	62	63	112	233	86	37
C	28	45	55	77	102	264	95	34
7B-A	10	9	24	49	103	199	124	49
B	10	23	25	46	86	223	96	34
C	10	9	13	48	84	247	129	34
8C-A	54	20	41	65	135	238	110	44
B	85	41	56	95	126	269	84	26
C	59	40	50	104	152	297	92	47
9D-A	35	24	26	45	68	112	66	35
B	24	29	49	70	116	160	65	27
C	45	41	53	136	121	204	66	27
10A-A	78	57	36	81	128	185	46	13
B	124	35	54	66	106	126	46	13
C	81	44	77	65	166	211	50	17
11B-A	21	6	26	61	114	196	77	36
B	13	18	24	50	120	303	95	36
C	52	32	28	94	160	243	76	27
12C-A	59	59	83	117	141	191	51	19
B	70	46	88	108	140	166	38	12
C	134	74	78	94	117	155	40	22
13D-A	24	27	41	60	135	299	133	60
B	60	41	52	112	162	314	132	79
C	33	36	58	103	168	340	100	39
14A-A	20	14	41	93	160	253	73	25
B	15	22	37	67	117	231	73	34
C	29	23	47	104	178	251	63	13

		% Furnish of Each Screen Fraction										
Total Wts	*Log #*	*1.5"*	*1.25"*	*1.0"*	*0.75"*	*0.5"*	*0.25"*	*Fines*	*Pan*		*Fines & Pan*	*1.5" to 0.75"*
591	1D-A	4.91	4.57	6.09	14.55	24.20	32.83	9.64	3.21	100.00	12.86	30.12
691	B	3.47	3.04	7.09	10.56	23.15	35.60	12.88	4.20	100.00	17.08	24.17
856	C	5.37	3.27	7.24	12.27	20.09	34.11	12.97	4.67	100.00	17.64	28.15
599	2A-A	12.35	5.18	8.85	9.85	17.70	32.22	10.52	3.34	100.00	13.86	36.23
825	B	11.76	5.45	8.97	10.06	18.06	28.36	10.91	6.42	100.00	17.33	36.24
741	C	15.92	4.05	8.91	8.64	19.70	27.67	10.12	4.99	100.00	15.11	37.52
680	3B-A	1.62	3.82	6.18	11.18	18.09	38.97	15.88	4.26	100.00	20.15	22.79
725	B	2.76	2.76	5.66	9.24	22.07	39.59	12.55	5.38	100.00	17.93	20.41
839	C	2.03	1.55	7.63	10.85	20.50	36.83	15.61	5.01	100.00	20.62	22.05
613	4C-A	5.87	4.57	10.60	13.05	18.92	31.65	10.44	4.89	100.00	15.33	34.09
849	B	6.95	4.83	7.89	16.61	18.73	30.04	9.31	5.65	100.00	14.96	36.28
644	C	8.54	5.59	8.39	12.27	21.12	29.19	9.78	5.12	100.00	14.91	34.78
753	5D-A	14.21	9.69	10.76	20.58	17.53	18.59	6.24	2.39	100.00	8.63	55.25
782	B	18.41	8.18	10.49	17.01	19.05	17.90	5.63	3.32	100.00	8.95	54.09
832	C	8.17	7.33	12.02	18.15	21.88	21.39	6.85	4.21	100.00	11.06	45.67
682	6A-A	8.80	6.16	7.18	9.38	15.98	36.36	12.90	3.23	100.00	16.13	31.52
680	B	7.79	5.00	9.12	9.26	16.47	34.26	12.65	5.44	100.00	18.09	31.18
700	C	4.00	6.43	7.86	11.00	14.57	37.71	13.57	4.86	100.00	18.43	29.29
567	7B-A	1.76	1.59	4.23	8.64	18.17	35.10	21.87	8.64	100.00	30.51	16.23
543	B	1.84	4.24	4.60	8.47	15.84	41.07	17.68	6.26	100.00	23.94	19.15
574	C	1.74	1.57	2.26	8.36	14.63	43.03	22.47	5.92	100.00	28.40	13.94
707	8C-A	7.64	2.83	5.80	9.19	19.09	33.66	15.56	6.22	100.00	21.78	25.46
784	B	10.84	5.23	7.14	12.12	16.33	34.31	10.71	3.32	100.00	14.03	35.33
841	C	7.02	4.76	5.95	12.37	18.07	35.32	10.94	5.59	100.00	16.53	30.08
411	9D-A	8.52	5.84	6.33	10.95	16.55	27.25	16.06	8.52	100.00	24.57	31.63
540	B	4.44	5.37	9.07	12.96	21.48	29.63	12.04	5.00	100.00	17.04	31.85
693	C	6.49	5.92	7.65	19.62	17.46	29.44	9.52	3.90	100.00	13.42	39.68
624	10A-A	12.50	9.13	5.77	12.98	20.51	29.65	7.37	2.08	100.00	9.46	40.38
570	B	21.75	6.14	9.47	11.58	18.60	22.11	8.07	2.28	100.00	10.35	48.95
711	C	11.39	6.19	10.83	9.14	23.35	29.68	7.03	2.39	100.00	9.42	37.55
537	11B-A	3.91	1.12	4.84	11.36	21.23	36.50	14.34	6.70	100.00	21.04	21.23
659	B	1.97	2.73	3.64	7.59	18.21	45.98	14.42	5.46	100.00	19.88	15.93
712	C	7.30	4.49	3.93	13.20	22.47	34.13	10.67	3.79	100.00	14.47	28.93
720	12C-A	8.19	8.19	11.53	16.25	19.58	26.53	7.08	2.64	100.00	9.72	44.17
668	B	10.48	6.89	13.17	16.17	20.96	24.85	5.69	1.80	100.00	7.49	46.71
714	C	18.77	10.36	10.92	13.17	16.39	21.71	5.60	3.08	100.00	8.68	53.22
779	13D-A	3.08	3.47	5.26	7.70	17.33	38.38	17.07	7.70	100.00	24.78	19.51
952	B	6.30	4.31	5.46	11.76	17.02	32.98	13.87	8.30	100.00	22.16	27.84
877	C	3.76	4.10	6.61	11.74	19.16	38.77	11.40	4.45	100.00	15.85	26.23
679	14A-A	2.95	2.06	6.04	13.70	23.56	37.26	10.75	3.68	100.00	14.43	24.74
596	B	2.52	3.69	6.21	11.24	19.63	38.76	12.25	5.70	100.00	17.95	23.66
708	C	4.10	3.25	6.64	14.69	25.14	35.45	8.90	1.84	100.00	10.73	28.67

MPB Log Screen Test after 30 Days Sprinkling and Stranding Cont'd

	Screen Fractions by Weight							
Log #	*1.5"*	*1.25"*	*1.0"*	*0.75"*	*0.5"*	*0.25"*	*Fines*	*Pan*
15B-A	70	38	84	108	168	256	52	18
B	103	38	67	133	179	286	67	36
C	109	70	69	122	167	277	70	23
16C-A	56	34	68	129	174	294	67	27
B	48	54	74	106	143	204	46	22
C	95	37	61	79	131	169	32	7
17D-A	18	20	35	79	161	202	73	28
B	13	20	44	78	141	226	87	27
C	12	20	50	106	166	241	86	43
18A-A	19	6	26	46	106	209	85	25
B	20	6	24	54	129	270	105	37
C	52	23	50	74	127	232	99	41
19B-A	169	46	66	139	150	178	69	47
B	148	56	72	93	121	142	53	35
C	184	82	96	130	127	181	51	31
20C-A	58	43	48	71	122	234	70	22
B	56	37	54	86	163	237	52	16
C	87	39	37	60	110	156	74	34

		% Furnish of Each Screen Fraction											
Total Wts	*Log #*	*1.5"*	*1.25"*	*1.0"*	*0.75"*	*0.5"*	*0.25"*	*Fines*	*Pan*		*Fines & Pan*	*1.5" to 0.75"*
796	15B-A	8.79	4.77	10.55	13.57	21.11	32.41	6.53	2.26	100.00	8.79	37.69
909	B	11.33	4.18	7.37	14.63	19.69	31.46	7.37	3.96	100.00	11.33	37.51
907	C	12.02	7.72	7.61	13.45	18.41	30.54	7.72	2.54	100.00	10.25	40.79
849	16C-A	6.60	4.00	8.01	15.19	20.49	34.63	7.89	3.18	100.00	11.07	33.80
697	B	6.89	7.75	10.62	15.21	20.52	29.27	6.60	3.16	100.00	9.76	40.46
611	C	15.55	6.06	9.98	12.93	21.44	27.66	5.24	1.15	100.00	6.38	44.52
616	17D-A	2.92	3.25	5.68	12.82	26.14	32.79	11.85	4.55	100.00	16.40	24.68
636	B	2.04	3.14	6.92	12.26	22.17	35.53	13.68	4.25	100.00	17.92	24.37
724	C	1.66	2.76	6.91	14.64	22.93	33.29	11.88	5.94	100.00	17.82	25.97
522	18A-A	3.64	1.15	4.98	8.81	20.31	40.04	16.28	4.79	100.00	21.07	18.58
645	B	3.10	0.93	3.72	8.37	20.00	41.86	16.28	5.74	100.00	22.02	16.12
698	C	7.45	3.30	7.16	10.60	18.19	33.24	14.18	5.87	100.00	20.06	28.51
864	19B-A	19.56	5.32	7.64	16.09	17.36	20.60	7.99	5.44	100.00	13.43	48.61
720	B	20.56	7.78	10.00	12.92	16.81	19.72	7.36	4.86	100.00	12.22	51.25
882	C	20.86	9.30	10.88	14.74	14.40	20.52	5.78	3.51	100.00	9.30	55.78
668	20C-A	8.68	6.44	7.19	10.63	18.26	35.03	10.48	3.29	100.00	13.77	32.93
701	B	7.99	5.28	7.70	12.27	23.25	33.81	7.42	2.28	100.00	9.70	33.24
596	C	14.60	6.38	6.21	10.07	18.46	26.17	12.42	5.70	100.00	18.12	37.25
	Average	8.11	4.91	7.56	12.31	19.48	32.06	11.11	4.47		15.59	32.88
	St. Dev.	5.51	2.22	2.33	2.93	2.63	6.34	3.94	1.70		5.33	10.63

MPB Log Screen Test after Vacuum-Pressure Soak

	Screen Fractions by Weight							
Log #	*1.5"*	*1.25"*	*1.0"*	*0.75"*	*0.5"*	*0.25"*	*Fines*	*Pan*
V1-A	30	58	56	94	175	297	133	113
B	28	11	62	123	170	305	138	105
C	37	34	69	83	150	306	155	128
V2-A	24	15	58	98	173	198	98	49
B	21	5	41	75	160	225	105	55
C	44	27	39	88	145	153	42	23
V3-A	35	22	48	87	161	180	75	38
B	29	46	72	132	202	276	114	41
C	30	41	59	88	188	254	116	61
V4-A	8	6	14	60	155	357	105	18
B	9	9	20	57	188	276	106	27
C	10	21	24	119	208	269	84	19
V5-A	12	6	18	39	92	179	69	14
B	33	15	26	49	95	221	100	16
C	9	16	29	54	76	143	83	33
V6-A	26	10	40	69	124	214	92	18
B	43	55	58	88	158	244	130	21
C	17	12	51	93	209	284	134	25
V7-A	20	9	25	57	126	158	91	18
B	7	19	34	101	161	305	95	21
C	2	7	21	63	143	207	120	34

		% Furnish of Each Screen Fraction								
Total Wts	*Log #*	*1.5"*	*1.25"*	*1.0"*	*0.75"*	*0.5"*	*0.25"*	*Fines*	*Pan*	
956	V1-A	3.14	6.07	5.86	9.83	18.31	31.07	13.91	11.82	100.00
942	B	2.97	1.17	6.58	13.06	18.05	32.38	14.65	11.15	100.00
962	C	3.85	3.53	7.17	8.63	15.59	31.81	16.11	13.31	100.00
713	V2-A	3.37	2.10	8.13	13.74	24.26	27.77	13.74	6.87	100.00
687	B	3.06	0.73	5.97	10.92	23.29	32.75	15.28	8.01	100.00
561	C	7.84	4.81	6.95	15.69	25.85	27.27	7.49	4.10	100.00
646	V3-A	5.42	3.41	7.43	13.47	24.92	27.86	11.61	5.88	100.00
912	B	3.18	5.04	7.89	14.47	22.15	30.26	12.50	4.50	100.00
837	C	3.58	4.90	7.05	10.51	22.46	30.35	13.86	7.29	100.00
728	V4-A	1.10	0.82	1.92	8.93	21.29	49.04	14.42	2.47	100.00
692	B	1.30	1.30	2.89	8.24	27.17	39.88	15.32	3.90	100.00
754	C	1.33	2.79	3.18	15.78	27.59	35.66	11.14	2.52	100.00
429	V5-A	2.80	1.40	4.20	9.09	21.45	41.72	16.08	3.26	100.00
555	B	5.95	2.70	4.68	8.83	17.12	39.82	18.02	2.88	100.00
443	C	2.03	3.61	6.55	12.19	17.16	32.28	18.74	7.45	100.00
593	V6-A	4.38	1.69	6.75	11.64	20.91	36.09	15.51	3.04	100.00
797	B	5.40	6.90	7.28	11.04	19.82	30.61	16.31	2.63	100.00
825	C	2.06	1.45	6.18	11.27	25.33	34.42	16.24	3.03	100.00
500	V7-A	4.00	1.00	5.00	11.40	25.20	31.60	18.20	3.60	100.00
743	B	0.94	2.56	4.58	13.59	21.67	41.05	12.79	2.83	100.00
597	C	0.34	1.17	3.52	10.55	23.95	34.67	20.10	5.70	100.00
706	Average	3.24	2.82	5.70	11.57	22.07	34.21	14.86	5.53	
	St. Dev.	1.86	1.83	1.77	2.29	3.45	5.47	2.86	3.28	

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